IN THIS ISSUE: An Electrical Christmas for the West

JOURNAL OF ELECTRICITY

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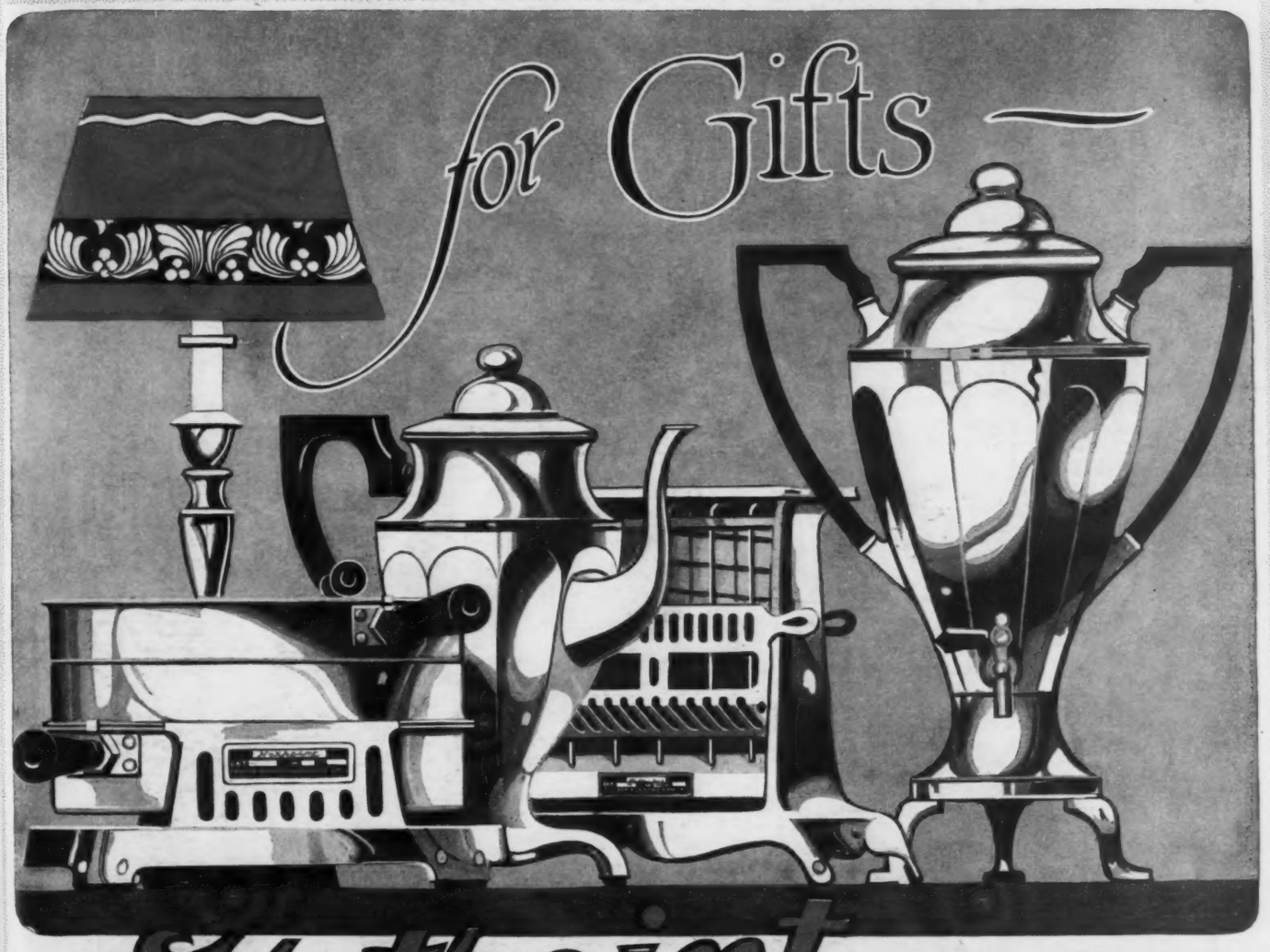

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ROBERT SIBLEY, Editor — H. W. L. GARDINER, Business Manager

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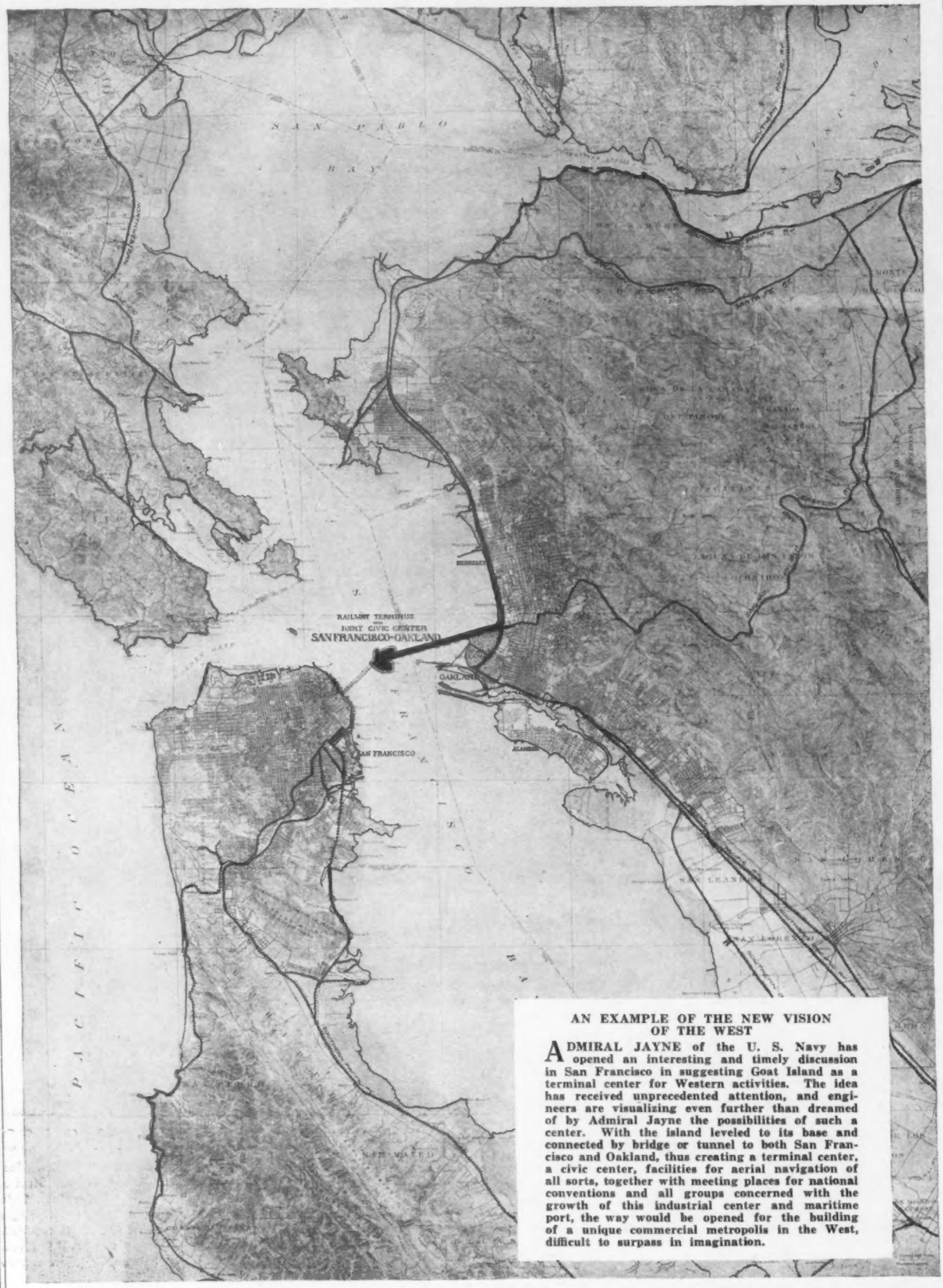

AN EXAMPLE OF THE NEW VISION OF THE WEST

ADMIRAL JAYNE of the U. S. Navy has opened an interesting and timely discussion in San Francisco in suggesting Goat Island as a terminal center for Western activities. The idea has received unprecedented attention, and engineers are visualizing even further than dreamed of by Admiral Jayne the possibilities of such a center. With the island leveled to its base and connected by bridge or tunnel to both San Francisco and Oakland, thus creating a terminal center, a civic center, facilities for aerial navigation of all sorts, together with meeting places for national conventions and all groups concerned with the growth of this industrial center and maritime port, the way would be opened for the building of a unique commercial metropolis in the West, difficult to surpass in imagination.

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JOURNAL OF ELECTRICITY

DEVOTED TO THE UPBUILDING OF THE ELECTRICAL INDUSTRY IN THE WEST AND IN THE COUNTRIES BORDERING THE GREAT PACIFIC

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SLUMP OR NO SLUMP THE WEST IS SECURE

SCARCELY three weeks have passed since Alexander T. Vogelsang, Assistant Secretary of the Interior, put before the National Convention of the Water Power League of America a vision of new industrial life of the West that is so fully in accord with the Western viewpoint that it has led a certain sense of optimism to assert itself throughout the West. Mr. Vogelsang stated that while the center of manufacturing and industrial activity is now in the East, the sources of power, coal, oil and hydroelectric energy coupled with the basic raw materials, have their center in the West. The only advantage the East has, he argues, is the labor reservoir incident to its larger population. In his allusion to the question of population, the West has felt a thrill due to the recent announcements from the Census Bureau at Washington concerning what has happened in this section during the last decade. Idaho's population has increased by 30%; Arizona leads all other states of the Union with its population increase of some 65%; California ranks next to Arizona with a population increase of 44.1%—a clean-cut million more people than it boasted ten years ago. The industrial survey reported from the census at Washington is most profoundly encouraging; the San Francisco-Oakland district, for instance, registers a population close to one million, with a manufacturing output totaling over three-quarters of a billion dollars annually. Los Angeles, too, has a growth in population and industrial activity of which the entire nation may well be proud, for she has now not only become the largest city of the Pacific Coast, but bids fair soon to be classed among America's greatest and most populous cities. With a prospect that these increases will not only be maintained during the current decade but will even be surpassed, the entire West is vibrant with possibilities of new development in industry, agriculture and the home. With hydroelectric energy as the basic supply for industry, the great electrical development of the West with its vast water powers is assured.

Appointment of Utility Commissioners

Utility regulating commissions throughout the nation have now been in successful operation for a sufficient number of years to make possible final conclusions on many important questions that formerly were held somewhat in doubt. One feature that has proved itself out beyond a question of a doubt is the method of appointment to these various utility commissions. In those states where utility commissioners have been elected by popular vote, glaring instances have arisen of political influence retarding the growth of utility service in such communities, and keeping the communities so served in a backward condition. Among those states that today are foremost in the matter of utility regulation, California may well be placed in the front rank. In a large measure, freedom of action of the regulatory body in that commonwealth is due principally to the fact that the commissioners serve upon appointment by the governor, the governor himself being held responsible to the people, thus fixing clean-cut responsibility for service. It would seem that these appointments might be lengthened out so as to cover a longer period than the four or five years customary in most of the commissions of this kind. These commissions might well serve either for life or over a period of many years. The financial aspect of the regulatory body, too, brings out another question, namely that of remuneration. If a state hopes to retain men of the highest type, it would be well to increase the salaries of these commissioners in order that the very best talent may be acquired. A salary of $8,000 in the commonwealth of California, for instance, is too small for the type of men and the responsibility required in a commission of such importance. But above all, direct responsibility to the government in the appointment of these commissioners is infinitely preferable to any form of direct nomination and election by the people.

9,677 electrical engineers belonged to the A. I. E. E. in 1919. The membership has greatly increased since that time and a large proportion of it will attend the 1920 convention at Salt Lake City.

HELP SALT LAKE CITY PUT IT OVER

THE ASSET OF COMMUNITY INTEREST

When the properties of the power company come to be reckoned among the show places of the city, the object of excursions for visiting sightseers, with views of the plants sold on postcards in the drug stores, the feeling of the community in question toward its electric utility may be assumed to be friendly. The Puget Sound Power and Light Company of Bellingham, Wash., has recognized the value of this element in good will, and with the idea of more firmly cementing the cordial good feeling in its district, is arranging to make its beautiful Nooksack Falls property accessible to visitors by providing a parking place for machines off the county highway and a foot-path across its land to a specially built platform overlooking this beauty spot.

The Christmas Spirit in Business

As the Christmas season draws near and is suggested by the sharpness of the morning air, there is the feeling that the world is after all a pretty good place and that it is good to be alive. While this is largely a physiological fact, it is well to stop and consider the psychological fact that it is possible to utilize the feeling which is predominant during this season of the year to secure better business relations with the consumers. This can be accomplished in many ways and should not be made so apparent that it will lose the effectiveness that comes from a spontaneous greeting or service. Some of the means by which this open-heartedness may be taken advantage of to make better friends of consumers are dealt with in an article appearing on another page of this issue, and one of the best ideas is to issue special instructions to all of the employes who come in contact with the consumers to be particularly courteous to them and to pass on the spirit of Christmas. Executives all up and down the line, from the president to the straw-boss, should set the example within the company so that the entire organization will be imbued with the spirit, and the conversion of the consumer into a booster will be accomplished unconsciously, as it must be if the greatest benefit is to be derived from the campaign.

Electrical Toys—a Christmas Opportunity

Electrical Christmas presents are already an institution, and the contractor-dealer has learned to plan for a great increase in appliance sales during the Christmas season; but in his rapid development of new ideas in merchandising he has tended to overlook one class of customers—the children. With the phenomenal increase in the demand for electrical toys, a logical place is created for the electrical retailer among those who cater to the juniors, especially at Christmas time, and dealers who have taken advantage of this condition have found the venture well repaid.

On another page of this issue are given some interesting facts and figures about toy merchandising, and its direct and indirect effect on the electrical retailer's business. Results achieved show that the advantages can be measured in dollars and cents as well as in many other ways.

Much has been said of the education of the customer, and much has been done, and is still being done, to familiarize the community at large with the electrical idea. In a few years' time the boy who owns a wireless set will own a home, and it goes without saying that he is more likely to have that home properly wired than the boy who does not know a battery from a motor. The girl who has made cookies for her dolls on a toy electric range will probably not make toast on an open fire when she starts housekeeping in earnest.

Apart from profitable sales and the education of customers, the dealer will think especially at the Christmas season of the good-will created by toy merchandising. The sale of toys provides the dealer with more outlet for his ingenuity and imagination than almost any other line, and a greater opportunity for making friends. It permits of merchandising devices which will add immeasurably to the human interest of his store, to its Christmas spirit, and consequently to its reputation as a place to buy Christmas presents. On this friendly atmosphere of service the contractor-dealer's place in the community largely depends, and no better time than Christmas can be chosen to establish it.

Possibilities in the Industrial Lighting Field

With sixty per cent of the industrial plants in the United States insufficiently lighted, a large field of profitable business is opened to the contractor-dealer who is aggressive enough to study the needs of the industrial plants in his territory and to sell the idea to industrial plant managers that there is a direct ratio between illumination and production. The time is coming when greater and greater demands are going to be made upon the contractor-dealer for suggestions as to proper lighting, and while he should not take the

place of the consulting engineer he must be conversant with the facts that make for better lighting conditions. This means constant study and application of the latest ideas in illumination. With the N. E. L. A. taking an active part in the campaign for better lighting, assisted by the various cooperative efforts, the contractor-dealer who really desires to keep up with this end of the industry will have plenty of assistance. These facts were brought out at a recent meeting of the San Francisco Electrical Development League by J. A. Vandegrift, sales manager of the National Lamp Works of Oakland. As an example of the opportunities in the West he brought out the fact that in San Francisco alone there were thirty-five hundred industrial plants of which at least one thousand had poor lighting conditions which were retarding their output. This new business is waiting for the contractor-dealer who should make every effort to know conditions in his territory, understand industrial lighting and so add to his volume of business.

Finding a Substitute for "Depreciation"

Considerable interest has been attached to the recent move of city ownership in San Francisco by which the depreciation fund of the city street railway system has been utilized to purchase bonds of the city's Hetch Hetchy water and power project, at that time in need of money to carry out its construction work. One of the evening papers in commenting favorably upon the situation argued that a "depreciation fund is merely another name for surplus," going on to point out that due to increased prices, the street railway system had not depreciated in any way since it had gone into service five years ago, but was actually worth more today than it was at that time!

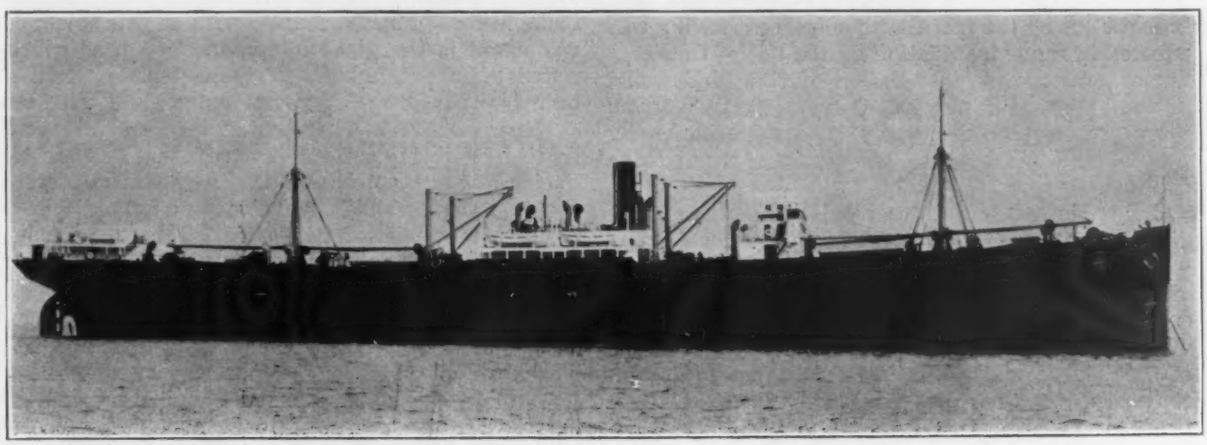
This is a shining example of the hazy conception which the public seems to hold on the subject of depreciation. The fact that the rails, road bed and cars would have to be replaced at the same or a higher price not so many years from now did not seem to enter the writer's head. Depreciation to him evidently applied purely to the risk which might be involved in a fluctuating market, a factor which does not effect depreciation in the least, except in so far as increased prices mean that equipment must be replaced at a higher cost. The power companies of the Northwest have suggested the use of the term "deferred maintenance" as a substitute for "depreciation." This is unfortunate in a way as it suggests that maintenance has not been kept up to date. Perhaps the most accurate term is that of "replacement fund" which cannot be misunderstood even by amateur economists. At any rate, it would seem that anything which the electrical industry can do to bring the use of a simplified term into general use would be a step in the way of progress.

Power Restrictions and the Rains

All restrictions on power service have now been declared off in California due to the recent plentiful rains that have visited that section. This brings to a close a most interesting situation in the West, and one in which the Journal of Electricity feels called upon to offer a word of commendation. Our readers throughout the West are familiar with the fact that due to the power shortage in California all the power companies, particularly those of northern and central California, have been greatly restricted in the use of power during the season just past, the restrictions being imposed by H. G. Butler, power administrator of the Railroad Commission of California.

One of the most interesting deductions of the power administrator's program is that of the efficacy of the skip-stop operation of the street railways. Enforcement of this plan throughout certain municipalities, especially San Francisco, proved not of great inconvenience to the public and yet at the same time the actual saving in power was marvelous. We commend Power Administrator Butler for the excellent

ELECTRIC PROPULSION FOR MERCHANT VESSELS



Electric propulsion for battleships is acknowledged a success. For some time it has been recognized that all future dreadnaughts would be electrically operated and the recent triumph of the "New Mexico" in winning the economy records in the test run has done away with any doubts as to the comparative costs of such operation. Now comes the electrically propelled general cargo merchant vessel. The S.S. "Eclipse," shown above, which is ready to be placed in active service with the American Line of the International Merchant Marine, was built by the Union Iron Works of San Francisco and is electrically operated throughout, the first of its kind to be put in operation in this country. The possibilities of this new field are yet to be explored.

and tactful way in which he handled the entire situation, and we point to the fact that once again the West has demonstrated its ability to emerge with flying colors from a situation that might have had disastrous results.

CARRYING INDUSTRIAL LIGHTING TO THE FACTORY OWNER

It is interesting to note how the subject of industrial lighting is coming to the fore in the West. The California Electrical Cooperative Campaign has within the last few days started on the installation of the permanent industrial lighting exhibit which it is establishing in San Francisco and Los Angeles for the education of electrical men and factory owners alike. A similar movement is being started in Portland and news has recently come of the appointment of a committee by the National Electric Light Association to carry the exhibit shown above, which was a feature of the Pasadena convention this spring, into all parts of the country. This interest is one of the symptoms of the industrial growth of this western country, a development which is fast taking this region into a new era of industrial prosperity.

Range Distribution Systems

The continued rise and prosperity of the electric range in the home brings up the subject of the distributing system for the ideal electric range load. Unquestionably the electric range is destined to play a role of increasing importance in the electrical industry throughout the West where hydroelectric energy is served by transmission systems of such unprecedented capacity and extent.

Economies of many sorts can be brought about in installation work as well as distribution work for the electric range. J. F. Farquhar at the recent Northwest Electric Light and Power Association brought out by the fact that a 40-percent saving was effected in range installation by the use of four conductor cable; while installation of this kind would not be approved in many districts of the West, still there are communities where it would undoubtedly prove of great value, and the economy is not to be doubted.

But above all, the exact balance for the range distribution service and the effect on regulation of various loads and communities served, are matters of great timely importance. D. L. Huntington, president of the Washington Water Power Company where one of the greatest developments in the use of the electric range has taken place, stated at this convention that the diversity factor brought about in the use of the electric range is far better than was at first anticipated. W. R. Putnam, general manager of the Idaho Power Company, who had so much to do with the authoritative data now incorporated in the publication of the N. E. L. A. on the subject of the electric range, brought out the fact that the four-cent rate may be economically applied in many places for the sale of energy to the electric range consumer, while Markham Cheever, chief engineer of the Utah Power & Light Company, showed how by the use of the double throw switch for the electric range and water heater, the connected load may be kept at a minimum.

To tie in with this discussion of range installation there should be more information on the best type of distribution system required. Now is the time when engineers should be consulted in gathering definite and conclusive data on this important subject of the distribution system best adapted to the economic use of the electric range load.

World Records Soon to Be Broken

The announcement of the Pacific Gas & Electric Company that at its Fall River Power Plant on the Pit River development there are to be installed two 40,000-hp. vertical turbine units of over 400-ft. head is extremely interesting in that these turbines will constitute the largest installation of this nature thus far accomplished, the giant units at Niagara being at the present time 37,500 hp. The year 1921 bids fair to be one which will see many records broken in the West. By that time the Kern River No. 3 power plant of the Southern California Edison Company which is installing Pelton Francis reaction type turbines of over 800-ft. drop will be in operation, thus breaking a world's record in this type of turbine. During February of 1921 the Caribou Plant of the Great Western Power Company will be put into operation, with a high-voltage line of 165,000 volts, surpassing any previous record in transmission of this nature ever undertaken. Later on in the year unquestionably either the Big Creek development of the Southern California Edison Company or the Fall River development of the Pacific Gas & Electric Company will have the distinction of breaking again a world's record by raising voltage transmission to 220,000; transformers carrying this high voltage are now being manufactured for these installations. Finally, coupled with all this power development is the giant interconnection that will be completed about January first between the San Joaquin Light & Power Corporation and the Pacific Gas & Electric network, whereby the Kerckhoff Plant will be tied in by 110,000-volt transmission lines to the Pacific Gas & Electric Company's system at Merced, thus making possible the delivery of large blocks of power to any part of California. This was touched upon in an editorial in the last issue of the Journal of Electricity.

Eastern men of the industry will get some conception of this new feat when they understand that blocks of power, through line capacity of at least 12,500 kw., can be transferred over distances equaling that from New York to Omaha, a distance of 1400 miles. Each day brings to light new and interesting records in the West of which these are the forerunners. The insistent demand for power throughout California, with fuel oil production in-

sufficient to supply the demands in steam auxiliary service, is leading the vision of the engineer to embrace even greater and more insurmountable obstacles in the matter of the harnessing of our water powers in the West.

Competition with the 5-10-15c Store

Those who have been watching the signs of the times have been interested in following the recent development of the chain store movement and its present tendency to enter the electrical field. Eastern cities are more familiar than the West with the chain store, the example of Woolworth having been already followed there by others. The same idea is now being carried into the electrical field. One corporation has recently undertaken a campaign of national advertising in the Saturday Evening Post, the first of the series being devoted to electrical fittings and the convenience of the chain store as a source of their supply. These stores, of course, would handle appliances and fittings on such a large scale that they would deal direct with the manufacturer—it is stated, indeed, that one of the larger manufacturers has been approached by such a company on the basis of taking over the entire factory output along certain appliance lines. It is obvious that these stores will not be confined to the 15c limit, but will operate along similar lines of underselling and fixed prices at a higher level.

There is no question but that the chain store is to be reckoned with as a factor in electrical merchandising the country over, an element whose competition along certain lines will be difficult to meet. There is no reason to be especially pessimistic over this fact, however. The five and ten-cent store has not put the general merchandise store out of business, nor—a fact which is even more significant—has the United Cigar Store competition wiped out the independent cigar store. The reason is, of course, that the public finds that it gets a special service from the independent establishment which is not possible in the mechanics of a chain store management.

The same line of reasoning will obtain for the electrical store—and indeed, the cooperative movements for better merchandising which are now under way in California, in the Northwest and Intermountain district and in British Columbia are the finest safeguards in the world for the electrical merchant. For the dealer whose store has nothing distinctive about it and whose methods of business are slipshod, the announcement of a chain store in every city district and even in smaller communities selling electrical goods at a price somewhat under his own, must come as a warning of another hazard in an already precarious future. The dealer who is in step with progress, however, and who has the safeguard of a clientele built upon a record of service rendered, has little to fear from this competition. The new movement is but another spur to the encouragement of efficient merchandising.

The Service of the Questionnaire

The long drawn out questionnaire has proved the bugaboo of many an engineer's existence. The one lesson we learn from this is that questionnaires being sent out to the various power companies and engineers for tabulated data should be limited in number. Yet it must be admitted that the most authoritative work that has been accomplished through technical journals and through the National Electric Light Association, the American Institute of Electrical Engineers, and other organizations devoted to the upbuilding of the industry, has been accomplished through the questionnaire. President Elliot of Harvard once said that there were three great rules that went for success in life and they are, patience, patience, patience. So it must be ever with the questionnaire. With careful thought the number of questions to be answered may be limited, and the labor thus saved in compilation becomes of considerable moment. The questionnaire is an invaluable instrument in the upbuilding of our industry and it must stand.

A New Journal Service

WITH this issue the Journal of Electricity inaugurates an enlarged editorial policy. The first few pages of the magazine constitute the most important contribution which its editors can make — they express the aims of the paper and carry the full weight of its influence in furthering those elements in Western thought which it believes to stand for the best in the electrical industry. It is felt that with the greater space allowed this department beginning with this issue and the addition of pictorial editorials, the Journal of Electricity can the better fulfill its aim of taking the lead in formulating Western opinion, as well as presenting a more complete review and commentary upon all that is significant in the nation's events from the Western point of view.

The Children's Christmas Electrical

(New ideas and new methods in the retail field have been among the conspicuous features of electrical progress during the past few years. The following article takes up the possibilities of electrical toys, an appropriate and profitable Christmas line which at present is but seldom handled by the electrical dealer.—The Editor.)

CHRISTMAS stands for a good many things, but to over twenty-four million children in the United States it means toys — everything from Teddy Bears to airplanes that Santa Claus manufactures at the North Pole workshop. The electrical dealer, with all his catering to the demands of the home, has not yet fully realized the possibilities of this immense market. Selling Aladdin's lamp to the housewife, he has often overlooked his opportunity of playing miracle-man to the junior members of the family.

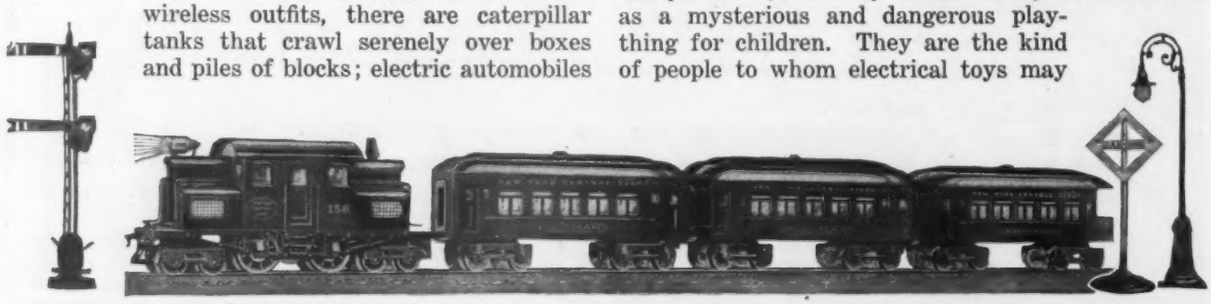
The illuminated Christmas tree is an integral part of Christmas. In the dealer's window why not combine it with electrical toys?

The demand for toys is on the increase, and the present annual production in the United States has a wholesale value of $35,000,000, with a growing proportion of educational toys. Among these, electrical toys are becoming increasingly important, as shown by the fact that the call for toy motors has trebled in the last year. The drum and the tin whistle, which amuse for an hour and then are relegated to the obscurity of the playroom closet, no longer satisfy either parent or children. The boy of today wants something which 'goes'; something to make; something which he can tinker and repair and adjust, and show off to his school mates. And if it 'goes by electricity,' then indeed he is a demigod among the mere mortals who wind up their trains with a key. Complacent parents look on with the satisfied feeling that the boy is 'learning something' —though more often a father is crawling round the floor himself. Perhaps the appeal of electrical toys to grown-up children is one of their secrets. Most fathers are not entirely disinterested in buying an electric train, and prefer it to a drum for other reasons than those stated.

The variety of electrical toys on the market this year is wider than ever. Besides electric trains and wireless outfits, there are caterpillar tanks that crawl serenely over boxes and piles of blocks; electric automobiles and boats; construction sets with which the budding engineer may construct his own motor and other apparatus; telephone sets; motion picture machines; electric dancers, and miniature electric ranges for the small girl with a large family of hungry dolls. There are many other toys which properly come within the sphere of the electrical dealer, to say nothing of Christmas tree lighting sets, and all sorts of novelties for Christmas tree decoration. A recent estimate of anticipated Christmas tree lighting sales gives $16,000,000 as the figure for 1920.

It is a mistaken idea that even now this great volume of Christmas business is handled exclusively by toy stores and department stores, though about 75 per cent of the business still goes through these channels. A hardware store in the Northwest records sales of toys amounting to $100,000 in a single year, many of the toys being, of course, electrical. If the hardware store, why not the electrical store? Figures show that the demand by electrical dealers has doubled this year, but numbers of them still hesitate to take up this line. A considerable demand is noticed, however, as coming from dealers in small towns and country districts where department stores are not in evidence.

The Christmas season is the great opportunity for the electrical dealer. Moreover, for the sale of electrical toys he has special advantages. In the first place his customers are largely home-makers and therefore usually concerned with children. Also they are people whose houses are wired for electricity, and who are 'sold' to a greater or lesser degree on the electrical idea. They do not have to be introduced to electricity; they have a certain familiarity with it, and they are not likely to think of it as a mysterious and dangerous plaything for children. They are the kind of people to whom electrical toys may



most logically and easily be sold. Moreover, the electrical dealer has the prestige of being 'an electrical man,' and therefore qualified to explain and sell electrical toys. Boy customers are liable to have more confidence in him than in a department store saleslady, and to come to him for advice and repairs.

Handling a Toy Stock

Dealers who handle electrical toys are enthusiastic about them. One Western dealer who always carries a large and varied stock of electrical toys for Christmas, states that during this season his toy sales amount to more than his sales of appliances. When one considers that a $20 electric train can often be sold with far less selling effort than an $8 electric iron, this is not hard to understand.

This same dealer, moreover, finds that it is not necessary, as some have thought, to carry other other kinds of toys in order to attract trade. Customers come in specifically for electrical toys. To meet the expected demand this season he has laid in a stock larger by about 50 per cent than that of last year, with a total retail value of $3,000. At the close of last season he had not more than one item of any one kind of toy left over—amounting to about one-half of one per cent of his stock. There is occasional demand for the toys at other seasons of the year, but he does not count on any but the Christmas season.

Though toys can usually be obtained from the toy jobber, it is necessary to order very early in the year for shipment from the factory. When this year delivery was made to a dealer in June, the electric trains were put on display at once, both in the window and inside the store. It was found that an electric train in operation was one of the cheapest and most effective window displays for any time of the year. The movement attracts attention, and the train is not injured for selling purposes. Moreover, parents shopping for appliances make a mental note of these displays, and remember them when Christmas time comes around. Youngsters shopping with their mothers also make a note of them, and also remember them when Christmas time comes. An electric train window display has collected enough of a crowd to cause a serious obstruction of the sidewalk.

One dealer has found electric trains to be without question the best seller among electrical toys. They range in price from about $9 to $75, but those above $40 appear to have only a limited sale in the electrical dealer's store. The sale of this type of electrical toy of course always carries with it the sale of a toy transformer. The trains run mostly on from 7 to 15 volts. In addition to the toy transformer, extra tracks and switches are usually sold, and various other accessories such as signals. If these are not bought originally, they are usually added shortly afterwards, or included among Christmas purchases the following year. Extensions to his railway system will generally please the small boy as much or more than a new toy, a fact which often solves the Christmas present problem for parents, as the possibilities are practically unlimited. The current consumption of the toys is of course negligible.

Another excellent seller, according to a dealer who knows, is the electrical construction set. The stock carried, however, must depend entirely upon the individual business, both as to variety and quantity.

Methods of the Department Store

The experience of department stores is slightly different from that of electrical dealers. These record a fairly steady demand for electrical toys throughout the year, though of course a much greater demand at Christmas time. A large Western department store having a very fully equipped

Both parents and children are demanding toys which have more than a momentary appeal, and electrical toys are becoming more and more popular for children of all ages.

toy department, and specializing in electrical and mechanical toys, finds wireless sets the most popular of all. Two wireless receiving stations have been set up, connected with an aerial on the roof. One of these is a miniature of a wireless room on an ocean liner, painted gray, and surmounted with miniature wireless towers with colored lights. Here ecstatic small boys listen in on the dot-and-dash conversations from the ships and government stations within range, with an air as important and business-like as if they understood every word.

This store maintains a special repair department and gives very thorough service on its toys, thereby making fast friends and getting some of the best kind of advertising it is possible to have. During the Christmas season, advertisements are run in the newspapers announcing special demonstrations, and a Saturday afternoon story-hour. The audiences at these affairs invariably explore the wonders of the toy department, carrying willing or reluctant parents

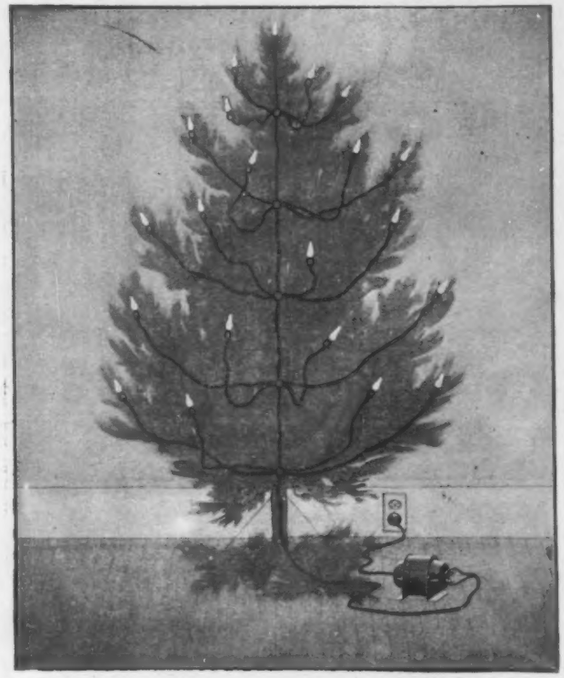
70,000 new homes are needed in Washington at the present time. Possible outlet installations, if each of these homes is properly electrified, will amount to $7,000,000 in business to the electrical contractors of Washington.

HELP THE NORTHWEST ELECTRICAL SERVICE LEAGUE PUT IT OVER

with them, and doing as much advertising of the charms of moving toys in five minutes as some other publicity methods do in five weeks.

Building for Christmas Business

The idea of a wireless receiving station is one which could easily be worked out with but little expense by the electrical store. The news of such an installation spreads like wildfire in any neighborhood where there are boys, and the enterprising dealer is likely to find himself a center of attraction with surprising rapidity.



A new Christmas tree lighting set is wired in multiple so that the burning out of one lamp does not spoil the tree.

Many electrical stores have sufficient space to fit up a special section for toys, where the various models can be connected and operated at any moment. The working toys are their own best salesmen, and call for but little sales effort. A toy department presided over by a benign Santa Claus has been tried out with great success. An illuminated Christmas tree is an effective addition.

The possibilities for window displays are among the chief charm of electrical toys. The train in operation has already been referred to. A beautifully decorated Christmas tree with colored electric lights has long been a favorite night display, and if supplemented by a few electrical toys will put the electrical dealer in a different class from "the store that sells the vacuum cleaners," as far as his small future customers are concerned.

Another appropriate Christmas display is the doll's tea party, with miniature electric ranges. Dolls can be used to great advantage with all kinds of electrical toy displays, and have a human interest appeal which never fails to attract attention.

Numerous publicity devices can be used to appeal to children—contests of various kinds, for instance. The dealer will always find his popularity with his junior clientele is not only a pleasant but a profitable side to his business. Children who bring up their parents correctly have considerable influence on their decisions, and the dealer who has done repairs for, and given advice to, the young wireless enthusiast, is pretty sure to be given a strong recommendation when the household wants a new toaster. The Christmas toy business has its influence on sales of appliances throughout the year.

The Christmas Electrical is not a new idea. Why not extend it to the children?

CUSTOMERS' COMMENTS

(How distinctly the woman shopper is influenced by the appearance and atmosphere of the store she patronizes is told here from the customer's point of view, and emphasizes the fact that business is as dependent as other phases of existence upon intangible amenities.—The Editor.)

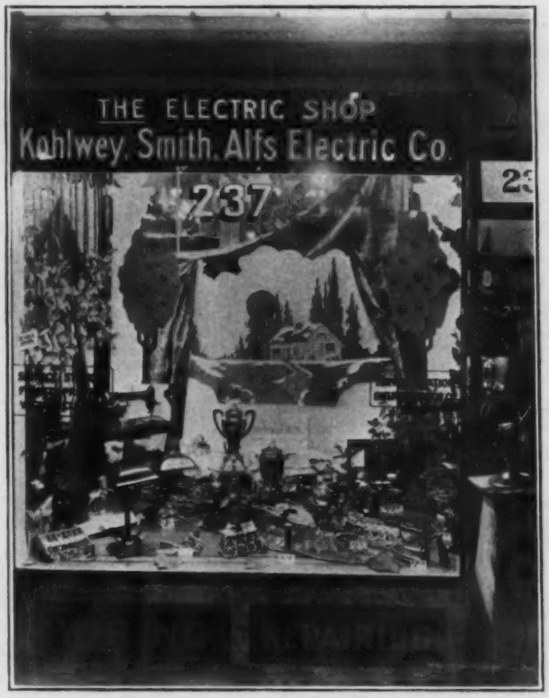
The electrical shop is like the automobile service station in that it handles standardized goods and must, therefore, draw any unusual trade by means of shop atmosphere rather than because of any price competition. For example, in visiting a number of shops in Oakland, I found each one asking the same price for a certain electric toaster. There was no element of price competition. How, then, is any one shop to draw more trade than the others? Most certainly by displaying and presenting its goods more attractively than the goods of its competitors; by developing an unusual shop atmosphere.

In a certain shopping centre there are two electrical stores, situated side by side. They illustrate what I mean by a difference in shop atmosphere. Upon entering the former, one is somewhat distracted and depressed. First, the store is dark—a condition rather incongruous and unnecessary in an electrical shop. Then, gas and electrical appliances of every kind overcrowd the store. No one article, or sort of articles, is allowed to stand out from the rest. Lamps, unlighted, are placed so close together that no one is distinguished from its neighbors. And then, in keeping with this shop atmosphere, I found that the clerk showing no enthusiasm over his goods. He volunteered no unnecessary information about the toaster which I looked at, and really seemed a bit more pleased to see me leave than to see me come.

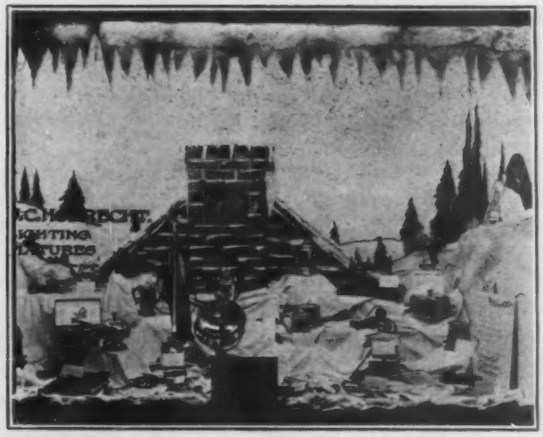
I stepped into the neighboring establishment. The glow from a number of lighted lamps on display was delightful. Such articles as grills and toasters glistened in the show cases. They appeared more like jewelry store material than like a sort of hardware. A woman clerk made me feel that the toasters she presented were the best on the market and that she, personally, was immensely interested in these particular articles. Naturally, I am going to "call again."

At the time of my visit, the second company was handling more customers than its neighbor. The quality and price of the goods in the two stores is too much alike to account for any difference in trade. The former is commanding patronage solely because of its pleasing service and shop atmosphere.

Christmas Windows



Brilliant and cheerful coloring—red, orange, blues and greens,—characterized the Christmas window of Kohlwey-Smith Electric Company, S. F. In the snowy background a small Santa Claus drove his sleigh swiftly down an incline and up the other side. Two Santas were provided so that too long an interval should not elapse between appearances.



An effective Christmas window in red, green and white distinguished the store of J. C. Hobrecht, Sacramento, California.

O. F. Abbott, Hanford, California, set off his Christmas display against a snowy white glitter, with touches of holly.

The awning outside the store of the Valley Electrical Supply Company, Fresno, California, was converted into a green bower with redwood boughs, and colored lights were strung in the foliage. In the window a toy electric train in operation, and two fountains and two lakes connected by a miniature river of running water attracted a great deal of attention.

A loaded Christmas tree, beautifully lighted, brought the Christmas spirit to the Utah Power & Light Company's "Electric Shop."

The Central Station and Christmas Service

(Originally the word 'company' meant a band of companions held together by a common cause. At the present time the word 'company' has come to have a different meaning, but that is no reason why the original meaning of the word should be forgotten. The results of a questionnaire sent out to the power companies of the West are listed below, and brought out in the following article which contains suggestions for bettering the relationship between company heads, employes and consumers during the Christmas season.—The Editor.)

The fact that power companies are generally classified in the mind of the consumer with other soulless corporations is the fault of the power companies themselves as well as their consumers. A power company or any other corporation is not a soulless thing but is a composite of many souls, each of which is a part of the whole and each of which is liable to be the standard by which the soul of the corporation is measured by the consumer. That this fact is recognized by the majority of the managers of the large power companies is apparent when it is known that at a recent meeting of the public relations committee of the National Electric Light Association the three most important matters brought up for discussion were, the relation between the company and the consumer, the relation between the company and its employes, and the relation between the companies themselves. The first two of these subjects are directly concerned with service, and just that much more intimately connected with the extra service that should be given during the holiday season.

THE QUESTIONNAIRE

1. **What efforts has your company made in the past to assist the contractor-dealer in the sale of appliances for Christmas presents? This should include advertising, demonstrations, exhibits, etc.**
2. **What plans have you for this year?**
3. **What form of gifts, good wishes, or advertising have you given the consumer during the Christmas season? This should include calendars, blotters, etc.**
4. **What are you planning along this line for the coming Christmas?**
5. **What gifts, bonuses or entertainments have you given your employes during the Christmas season? This should include dances, plays, bonuses, etc.**
6. **What are your plans along this line for this Christmas?**
7. **Have you given any special instructions to your employes about Christmas time to spread the message of "Good Will to Men" toward the consumers during the Christmas season?**

In the belief that service is one of the biggest assets that a power company can have, a questionnaire was sent out to the largest power companies in the West and some of the smaller ones, to find out what efforts were being made to capitalize on the receptivity of the consumer's mind at the Christmas season. For at that period of the year one hesitates to play "Old Scrooge" and it is the ideal season to do some good deeds that will soften the wrath of the consumer for the rest of the year to come. For the purpose of comparison the soul of the power company is represented by the answers to the questionnaires that were received; especially the answers to the two questions, "What form of gift, good wishes, or advertising have you given the consumer during the Christmas season?" and "What gifts, bonuses or entertainments have you given to your employes during the Christmas season? This should include gifts, dances, plays, bonuses, etc." Some had good deeds in the past to boast of, some made excuses for not having done more, and some probably muttered to themselves "Bosh," the exact word of old Scrooge, and wrote down, "None."

The first two questions asked had to do with the cooperation with contractor-dealers in pushing the sale of electric appliances for Christmas presents. Since this is the day of cooperation in the industry the answers were all practically the same; that by advertisements in the newspapers, by window displays, by stuffers in bills, and by car cards they have suggested to their consumers that the smaller electrical appliances make ideal Christmas gifts. That is of course done from the self-interest standpoint as the returns from the sale of appliances are going to increase the customer's bills, but the increase of good will of employes and consumers in most cases seems to have been forgotten.

The smaller power companies seem to excel in rendering Christmas service, which is probably due to the fact that the head of the company is closer to all the employes and understands them better. Consequently he can understand their needs, and by treating each individual case can assure each member of the company in person of his interest.

Of course, the manager of the company is not to blame in each case as he is directly responsible to a board of directors and a finance committee, so for the benefit of these worthy gentlemen who probably do not know one per cent of the employes in their respective companies, let us put the whole case in dollars and cents. Money talks in this case, and as they feel responsible to the stockholders for each cent of money expended, let us for a minute forget the altruistic side of making a real true Christmas spirit exist in the hearts of consumers and employes, and figure out on the self-interest basis just why they should do this thing from a financial point of view.

The Christmas Bonus

A practice employed by some of the largest corporations in the country is to give a bonus at Christmas time to all employes who have been in the employ of that company for a certain length of time. This plan has its disadvantages, but at least the money thus expended does not have to be given to the government as it may be counted as a gift or as salaries. Just before Christmas there are several of us who are figuring just where the money is to come from to buy the doll or drum desired by the lord or lady of our household. For the salaried man

this bonus would only be a slight recompense for the many hours of overtime which he has given to the company cheerfully throughout the year without any thought of reward except that of clear conscience for a job well done.

Then let us take the idea of a small useful gift such as an "Eversharp" pencil for each employe. This is surely a gift, and can be deducted from the income tax return which must be given to the government next March. A little thing! Yes, it is, but nevertheless every time that the employe uses that pencil during the next year he is going to think of the donor, and that thought is going to be one of appreciation.

One company gave insurance to its employes for a Christmas gift a few years ago and every Christmas since then has paid the premium on that insurance for the employe. That is a fine idea, but how is the employe notified that his premium has been paid? Is a receipted bill sent him or a brief business letter on company stationery, stating that the premium has been paid and will Mr. Smith please acknowledge receipt of the same with thanks? If so, then that particular company has lost a big opportunity to make the gift more effective. If the manager of that company has put that particular message of the paid premium on an engraved card with a cheery Christmas greeting, asking the employe to accept the receipt for his insurance as a slight appreciation by the company of the loyalty he had shown during the year, the spirit of giving has gone along with it and made the gift more effective.

Company Celebrations

A certain company decided to celebrate Christmas in the proper way and so the members of the office employes' association of that company all chipped in and gathered about two hundred and fifty dollars together and with it bought presents for their children and gave themselves a party at which they danced and had a tree for the children. This is all right, but the fact that an association of employes giving a party in the name of the company had to provide their own wherewithal, should have made it a rather peculiar Christmas for the members of the finance board, especially if they attended the party; and they were all invited. Even if the company were on the wrong side of the ledger, the stockholders would not have begrudged that two hundred and fifty dollars to the employes for a Christmas party. It might well have been charged to additions and betterments; additions to loyalty and betterment to esprit de corps.

The Company Christmas Summarized

Summarizing the answers to the questionnaires: twenty-five letters were sent out: thirteen were answered: of the thirteen answers to the two questions given above six read "None" and two of these defended themselves on the ground that "their employes were paid better than the average." One company had taken out insurance for its employes, one had given a party with a tree and presents for the "kiddies," and one had sent Christmas greetings to its consumers by means of an advertisement in the newspapers.

Of the remaining three one had sent some small, inexpensive but useful present to each employe, combined with a dinner at which the officers and men of the company got closer together, and a card to each consumer (and while this company is not in the best financial condition its employes own stock and are one hundred per cent for the company). Another had been in the habit of giving a turkey and a basket of delicacies to each employe but due to the high prices of foodstuffs had been forced to abandon this idea for a less ambitious schedule. The third company through its employes' association had given a big entertainment and dance which was repeated in several parts of the wide territory covered by this company so that all of the members of the association might have an opportunity to participate in the spirit of the festivities.

Creating the Christmas Spirit

A small gift, not necessarily money, at this time of the year will do more towards cementing the bond between employer and employe than all of the "good will men" who are sometimes employed for this purpose. And the salaries paid them for one year, judiciously expended at this time will accomplish more than they could in double the time. For the company that can afford to spend money on individual gifts there are many ways of bringing about the desired result. Let the "big boss" take the afternoon before Christmas off and visit his department heads and as many others as he can reach and wish them the good old-fashioned "Merry Christmas" with a smile and good stiff hand-shake. Let the department heads do the same and all the way down the line to the "straw boss," so that each employe of the company is sent home on Christmas eve in the right spirit. Do the employes get paid on the twenty-fifth of each month? Then when they are paid the day before Christmas, have some little stickers made up in bright colors with a sprig of holly on them and a cheery message of Christmas greetings from the company. Are all of the district offices tied in with the head office by telephone? Then have the operator get them all on the line at once just before closing time and wish all of them the good old wish from the head office represented by the general manager, or better yet, the president. Tell them to pass the good word along. Let the married men off at three o'clock the day before Christmas so they can get in some shopping with their wives before the stores are stripped clean. Or let them have an extra hour off for lunch the week before Christmas so that they can do their shopping. If there are any promotions or raises in salary to be made during December, save them until

50,000,000 acres of land in Colorado are over 5,000 ft. in altitude. A great part of the farming lands receive irrigation and domestic water through electric pumping. Colorado's growth is in large measure dependent upon the development of its abundant water powers.

HELP COLORADO
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the twenty-fourth and send the party a little note to be opened the next morning, telling him of the raise, and that it is retroactive. If there are any promotions to be made at the first of the year, send the same note telling him of the fact. And if an employe is to be dismissed, save the blow until after Christmas so that he may be happy on that one day, even if he is going to be out of a job for the next year.

Including the Customer

Have the customers seemed unappreciative of the excellent service rendered during the past year? Remember that every public utility is the servant of the people and do you take the service given to the company by the employes who are under your charge as granted, and figure that is what you are paying them for? That is the way that the public regard the power company. If you want your employe to wish you well on Christmas day you exchange greetings with him, and you like to have him initiate the greetings. It is exactly the same with the intangible, soulless power company. Send out an engraved Christmas card to each of your consumers and the day he receives it, if it is nicely worded and distinctive, he will wish you well, and some of that is going to stay with him and cut down the cost of running the complaint department. A card stating that on account of the season of the year and recognizing the fact that at this time of the year you need some extra pin money, therefore December bills will not be due until January. True that the interest on that amount of money outstanding is considerable, but the uncollectible account column would be less in the next six months, for that courtesy would be recognized by some who might otherwise be inclined to let their account slide.

See that special notice is given to each employe who comes in contact with the public, that during the week before Christmas he must pay unusual attention to the wants of the consumers, that he must take advantage of the open-heartedness of the consumer at this time of the year, and slip into that consumer's heart a greater appreciation of the company and what it is doing. The day before Christmas each employe should be instructed to wish each consumer with whom he comes in contact, the old wish, not perfunctorily but with a whole heart. Instruct the telephone operator and the complaint men that on Christmas day they must thank each consumer for being able to be of service and pass on the message, of "good will to men." Let the telephone operator on Christmas day add a "Merry Christmas" to her "Hello" when she answers the incoming calls.

A Profitable Investment

The results from such service rendered to the employe and consumer can not be directly appraised but it is safe to say that the extra efforts and loyalty it will bring from employes and the added consideration, toleration and thoughtfulness it will bring on the part of the consumer will more than pay the interest on the money so invested. This is the day of cooperation in the industry and when the employer has studied cooperation between the branches of the industry and seen the results obtained he can not help but believe that some of this same cooperation between himself and his employes and consumers of the company, will bring even greater results and the satisfaction in knowing that he is rendering toward them what he preaches to them, "Service."

TENNIS AT NIGHT

BY I. E. VOYER

(An illumination engineer with the San Francisco office of the General Electric Company tells here how the tennis courts at Golden Gate Park are so well illuminated that players of considerable reputation say they can play faster tennis under this system than during daylight.—The Editor.)

Tennis for years has been one of California's most popular out-of-doors sports. During the past four years because of the high cost of labor and materials insufficient new courts have been added to take care of the natural increase in population and the new people attracted to this sport, and of late ways and means are being sought to increase the capacity of the now overcrowded courts. Those interested in the development of outdoor illumination have been looking to the time when this science should come to the aid of the tennis player.

The real tryout has come with the standard overhead Mazda installation on two of the public courts in Golden Gate Park, San Francisco. It is the intention to give this installation a thorough tryout, and if night tennis playing becomes popular with the public, the other eighteen asphalt courts in the Golden Gate Park group will be similarly lighted.

The accompanying photograph shows the courts in use. Each court has four 1000-watt Edison Mazda lamps, equipped with Ivanhoe BEE 1000 metal reflectors mounted thirty feet above the playing surface, and suspended from steel messenger cables supported by guyed wooden poles. The service is carried to the lamps through a keylock switch mounted on the poles located at one end of the court. By means of this either or both courts may be lighted by the author-

Professionals who have played on these courts state that they are better able to gauge the flight of the ball and to more accurately time their strokes because of the constant shadows produced by the fixed position of the overhead lights.

ized person in possession of the locking key. The courts are open to the public, and are being patronized principally by those who must work during the day.

The courts were officially opened for night playing by an exhibition match under the auspices of the Golden Gate Park Tennis Club, between Marvin Griffin, former State singles champion, and Roland Roberts, Pacific Coast champion for 1919. Roberts is one of the hardest hitting tennis players in the game today, and the outstanding feature of the match was the apparent ease with which Griffin handled his cannon-ball serves and drives under the light of the four 1000-watt lamps. Commenting on the lighting after the game, both players expressed satisfaction with the quality of light and the absence of disconcerting glare. They further stated that they were able to gauge the flight of the ball and time their strokes accurately because of the constant shadows produced by the fixed position of the overhead lights. Other players of considerable reputation who have played under the overhead system have said that they could play faster tennis under this system than during daylight, because of the constant direction of the shadows.

The lighting of tennis courts and recreation parks for handball, basketball and other games of that nature, not only offers an excellent field for an additional lighting load for the central station and lighting equipment business, but is a good publicity agent for popularizing artificial lighting among the general public. A start may be hard to make, but additions come with less effort.

The Electric Appliance Dealer and His Future

BY C. A. PARMELEE

(Every day it is becoming more evident that business advancement in this country depends upon the development of hydroelectric power. The necessity of this development to the electrical contractor-dealer is the main point in this comprehensive discussion by the vice-president and general manager of Dohrmann Commercial Company.—The Editor.)

World-conditions during the past six years have caused a scarcity of coal which has caused prices to advance until, in many places, they are almost prohibitive. This excessive cost and small supply of fuel has dangerously hampered industry. Nevertheless the black cloud is beginning to show its silver lining. The solution is "white coal" developed by water power.

The last session of Congress put in motion legislation which will make possible the development of millions of horsepower of electric energy which can be carried to a large part of our population. We read of similar action being taken in Italy, Switzerland, and other parts of the world. Billions of dollars will be spent during the next ten years to develop these plans.

Future for Electrical Dealers —

A careful survey of the above facts should give the electrical dealer great confidence in the future of his business. Every home should be a live prospect for electrical household appliances. The scarcity of domestic help is creating an ever-increasing demand for labor saving devices. The simplicity and efficiency of these devices appeal to all, especially the housewife. The desire to possess is being created and intensified by judicious advertising and numberless articles which are appearing in popular magazines.

Under date of October 9, the International News Service sent out the following, which appeared in our dailies as a news item:

WORKLESS AGE FOR WOMEN DAWNS WITH ELECTRICITY

NEW YORK, Oct. 8.—If the craze for making things go by electricity keeps up, here are some of the things bound to happen:

Women left without work of any kind.

The housewife judged not by the way she keeps her house but by the way she oils her motors.

The feminine touch lost in home making.

Business offices operated by turning a switch.

A visit today to the latest electrical show has convinced one that feminine working stock is very much on the decline. There is no bit of labor in or about the home for which some shiny and efficient looking device is not shown.

Time for Scientific Merchandising —

The electric appliance business has passed the experimental stage; we know many things that we formerly hoped for or believed. But because the going is a little easier, there is no reason why the electrical dealers should settle back into what may be a fool's paradise. Much of the educational work has been done by the electrical man and as the appliance business becomes standardized and staple, it is much easier for the general store to handle than formerly.

The electrical dealer should recognize that his competition is just beginning—and in order to hold his own he must not only admit that he has a competitor, but study this competitor's methods and copy his strong points. Of these methods and principles a few can be listed here that are vital and come near embracing all the essentials necessary to success. What does the department-store manager know, for instance at **all** times?

1. Value of stock on hand.
2. Sales, daily and monthly, which are arranged to show turnover.
3. Rate of gross profit by percent.
4. Actual expense, and this shown in percent on sales.
5. Expense divided as to main items such as Rent, Salary, Advertising, Interest, etc., showing exactly what it is costing in percenting of expense on each of these and many other important items.

A dealer who is fortified with the above information can go forward in confidence; if making money he knows it and can plan expansion; if losing,

1,000,000,000,000 board feet of timber are estimated to be standing in Oregon, Washington and Idaho today, giving opportunity for a tremendous development in the manufacture of wood products, already a foremost industry in the Northwest.

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he knows it and can get busy to correct the fault. A vast number of failures and only ordinary successes can be traced primarily to the lack of knowledge of the dealer of his own business, caused by faulty accounting, or, frequently, to utter lack of accounting.

What the Jewelers Have Learned —

The retail jewelers of America have had the reputation of being a most unbusiness-like set of merchants. Their marked successes were few, their failures many. Often a small jeweler would carry a stock entirely out of proportion to his sales; being a repair man, he would spend much time on repair work, which would help greatly in meeting the daily bills; would neglect his stock, get behind in his accounts and pay little attention to turnover; had no system of accounting, did not know whether he was making money or losing. About ten years ago an active campaign was put on in organizing jewelers of all states into associations. These state associations combined and made a strong national association which today has thousands of members. Through cooperation, meetings, conventions, and able work of their officers, a systematic campaign of education has been carried on until today a generally uniform system of education has been adopted. The jeweler is becoming an educated merchant. He knows what gross profit he should make, knows what expense means, and that he should draw a fixed salary which is a part of expense; that proper rent should be charged even when the building is owned by himself, and a score of other things he did not know before.

This display which appeared in the window of Nathan-Dohrmann Company, San Francisco, suggests that the electrical contractor-dealer can gain a great deal from observing the methods which certain large department stores use in selling electrical apparatus.

Recently through the efforts of a national field officer and the research work of Harvard University, statistics have been gathered from thousands of jewelers, showing the average expense of doing business in the retail jewelry trade. This valuable information plus a greatly increased gross profit, due to cooperative effort and education, is making the retail jeweler a much better merchant, a better credit risk and a far better competitor.

The electrical dealers have many problems to solve which are similar to those of the jeweler. Contract and repair work should be separate from merchandising.

Gross Profits Too Low —

The gross profit on many advertised articles is too low. The combined effort of dealers can rectify this, but the dealer must fortify his argument with the manufacturers, with figures showing the cost of doing business.

We are now entering a period of readjustment which may result in depressed business conditions for a time. No doubt prices of electric appliances, in sympathy with other lines, will gradually decline until a proper level is reached. Great care should be given to carefully adjust stocks, and cautious buying should be the rule.

The instalment business as applied to many of the larger electrical appliances should be very carefully studied and this line of credit avoided by all who are not financially able to carry such accounts. It should also be borne in mind that any general business depression which would result in any considerable amount of unemployment, would reflect seriously on the ability of the dealer to make normal collections on instalment accounts.

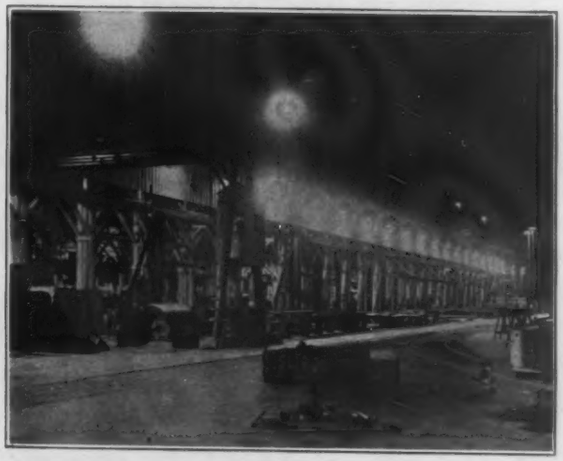
There is but one conclusion in summing up the question of the appliance dealer and his future. There can hardly be found a field of action more promising and bright, and the possibilities are almost unlimited. Yet no prophet today can state with any degree of certainty, whether the vast and profitable business of the future in these lines will be done by the electrical dealer or his competitor. The man who meets present day conditions in a wise, up-to-the-minute manner will reap the reward.

MOTION PICTURES IN THE HOME

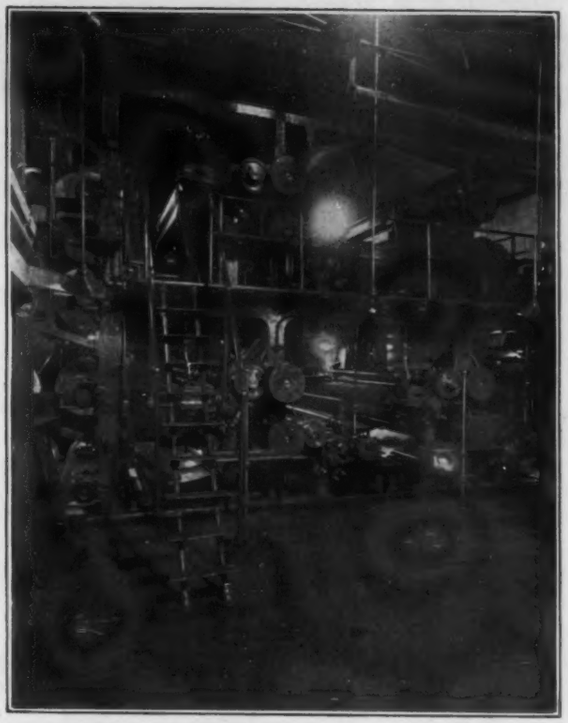
A New York inventor reports that he has converted the regular roll film to a non-inflammable flat record. On each 10½-picture record there are 1300 pictures equal to 85 feet of roll film. Pictures are converted to the spiral records from the ordinary roll film, yet the reduced pictures retain all the clearness of the original. The picture record is mounted on a machine with a plug for an electric lamp socket.

Increasing Production Through Good Lighting

In the large lamp assembly room of a modern lamp factory this scientific diffusion of artificial light from above is even more favorable to close detailed work than daylight from the side windows.



Lighting by angle reflectors and flood lights enables employes in the plant of the Southwestern Shipbuilding Company at San Pedro, California, to work as safely and rapidly by night as by day.



The giant octuple press in a San Francisco newspaper office, with a capacity of 50,000 32-page newspapers per hour, is lighted with 18 75-watt lamps and Benjamin elliptical angle reflectors, horizontal intensity 7-ft. candles.

Along with the discovery that proper lighting and efficient work go together, there has arisen the most widespread interest in the science of industrial lighting. The elimination of glare, and the study of the exact intensities and angles of illumination required for different types of work are doing much to increase production as well as safety.

Lathe work in the machine shops of the National Lamp Works of the General Electric Company, requiring close concentration on details, is facilitated by an average horizontal light intensity of 10 ft-candles.

A light intensity of about 8 ft.-candles is maintained in this Oakland machine shop, where a lighting installation by the Westinghouse Company gives an evenly distributed illumination without glare or deep shadows.

Industrial Illumination

BY J. J. McLAUGHLIN

(Up to this time the ideal of artificial illumination in the industrial plant has been an approximation to daylight but here an Illumination Engineer with the Westinghouse Lamp Company shows how a scientifically planned overhead lighting system is even better for fine work than the natural light from the windows. The many advantages of this system over the system of local illumination previously used are also shown.—The Editor.)

For some time past the fragile, unsightly and expensive system of drop lighting in industrial plants has been slowly replaced by large, efficient overhead lighting units. The local lights were irregularly placed, hung at various heights, and in a more or less dilapidated, not to say unsafe condition. Commonly they were not designed nor placed by an engineer conversant with maintenance efficiency or hygiene. The general or broadcast lighting installations that are replacing them consist of larger wattage lamps, spaced on symmetrical centers, or placed carefully and sensibly with reference to the locations of machines, tables, benches or aisles where the work is performed. The systematic and symmetrical placing of these machines or tables has contributed to the symmetrical placing of the overhead lighting units, with the final result that the entire space changes from one that gave an impression of an unkempt, haphazard junk shop to one that is free and open, clean and cheerful.

Scientifically designed general overhead lighting has replaced the local lamps in this department of a lamp factory where the most exacting detail work is performed. The size, height and color of the lights, the focusing of reflectors and spacing of lights, and the spacing of the units over the room have all been planned with care.

A daylight view of the room shown opposite. It can be seen that the artificial illumination is as good as the natural light, and further that the symmetric spacing of the overhead lights makes the former more uniform than that coming from the windows in the far end of the room.

Yet this transformation from local to general lighting progresses very slowly. Work of the ordinary degree of exactness and precision has been illuminated successfully with general overhead lighting, but local lighting is still used for fine or close work under the misapprehension that such operations can be illuminated satisfactorily in no other manner. Case after case establishes the proof that a proper overhead lighting system may satisfactorily replace the local lighting system at a lowered cost.

Errors of Local Illumination —

Other factors just as important as the foot-candles required for a given close operation should be considered in designing and applying general overhead lighting for detail work. When the local drop light was inadequate under the old system, a larger wattage lamp has been the simple remedy. "One light only will not make any difference in the operating expense of a whole factory," thought the workman, and besides, a large lamp bulb was the average workman's idea of good illumination. Often one sees large lamps half again as large as the reflectors, or the reflectors entirely removed to allow larger lamps. Furthermore, if the local light was glaring it affected but one operator, and very little was ever said about it; or if it were wasteful, its correction was neglected because of its apparent insignificance.

But with general overhead lighting the spacing and mounting heights of lamps and reflectors, as well as types of reflectors, lamp sizes and colors must be in accordance with the very best engineering practice, else the entire operations suffer.

Illumination in a Lamp Factory —

In the department of a lamp factory where the work of winding fine wire on lamp arbors is done almost entirely by hand, there must be no variation and no mistakes. Before the new general illumination, as shown in the illustration, was adopted, local lighting units were used which were made up of brackets fastened to the tables, with tin angle reflectors painted white on the inner reflecting surfaces and equipped with 25 to 60-watt clear Mazda B lamps. This fixture was placed very close to the clamp, thereby giving a high intensity varying from 15 to 30 foot-candles, depending upon the size of the lamp used for each working position, and effective over only a limited area closely surrounding each

lamp. There being no overhead lamps, the other parts of the department were very dark, thus creating an impression of gloom upon the workers.

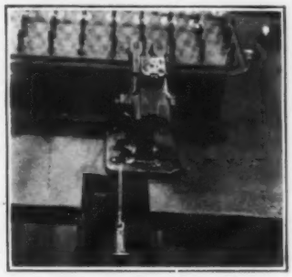
There was a constant and unavoidable strain on the eyes, since they had to be adjusted from the excessive brightness near the hands to the other extreme of darkness in the balance of the room. Such conditions resulted also in poor supervision on the part of the person in charge of the department.

Change to Overhead Lighting —

These disadvantages resulting from local lighting were removed, and improvements in various ways were added by installing the new overhead general lighting. After careful engineering study the Mazda C-2, or "daylight" lamp was used in order to obtain as nearly as possible the same color effect as the natural light, and to secure detail and contrast when observing the fine gray filaments during the mounting operations. A good idea of the close approach of artificial illumination to daylight conditions is obtained by comparing the view of night conditions with the one showing natural lighting at midday. In fact, the distribution of artificial light is more uniform than is daylight illumination. This is due to the fact that the lamps, spaced symmetrically overhead and across the room, give the same intensity of illumination upon each square foot of floor area, whereas the natural lighting, coming from the windows on the sides, decreases rapidly from the windows to the center bays.

On clear days the intensity of natural lighting being high in the bays adjoining the windows, the artificial lighting is not required at these points. But due to the rapid decrease of daylight intensities towards the center of the room, the artificial lights are here used during the entire day and no marked contrasts are noticeable between lighting values nor in work accomplished. On cloudy days and late in the afternoon it is necessary to use all of the lamps. Thus through the flexible switching and the Mazda C-2 daylight lamp, the blending of intensities and colors is successfully accomplished. No such results had ever been possible when using individually controlled lights.

In the accompanying illustration a filament of a 40-watt Mazda B lamp is shown mounted on a stem. This view was taken at night under the new lighting system and it is evident from the unretouched picture how well a fine wire can be seen. One factor that helps very materially to make the filament stand out is the black cloth receptacle, seen just below the clamp. This forms a background for viewing the filament when it is mounted on the stem.



A picture taken at night under the new lighting system which shows how the finest lamp filaments can be seen perfectly.

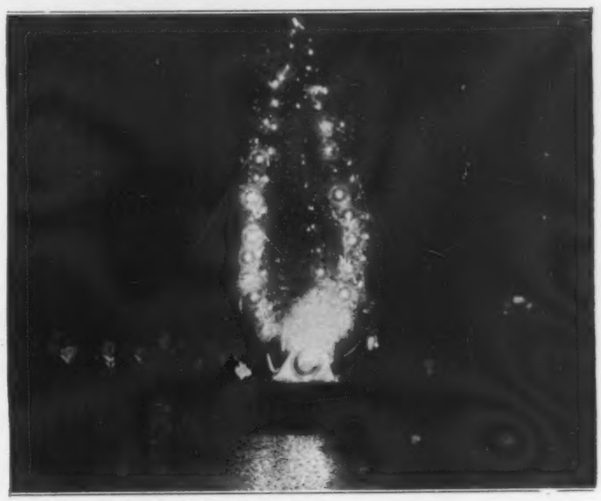
A careful study of the actual requirements of lighting close work in an industrial plant must always be made before general illumination from overhead units can be applied successfully. General lighting is usually preferable to local lighting for even the detail manufacturing operations, but it is not "fool proof." The improvement described above is due not merely to a change in the system, but results from proper lamps at the right height; proper focusing reflectors to eliminate waste light; proper color of light, and proper control.

Necessity of Careful Analysis —

If a general overhead lighting system is to do more than a local lighting system can accomplish, the following factors must be considered: The amount and direction of the natural lighting coming through the windows; the requisite intensity of illumination in foot-candles; the vertical, horizontal or angular surfaces and the color of the work to be lighted; the type of reflector, chosen for its illuminating characteristics, its durability and its ease of maintenance; the lamp itself, as to color of light, fragility and glare; the spacing of lamps and reflectors with reference to the work; the height of the lighting units; the background against which the work appears; the flexibility of control, and the elimination of polished surfaces directly within the field of vision of the work.

CHRISTMAS OVER THERE

No situation is serious enough to overshadow the importance of Christmas in the American mind. One would suppose that a Christmas tree for the army of occupation in Germany last year was an impossibility, but in spite of war, ruin and cold, a glorious tree glowed in the center of a German town on Christmas eve and sent out its cheer to the conquered people and homesick soldiers.



A Christmas tree for the army of occupation which appears erected in the center of a small German town was a thing of beauty as well as of cheer. We do not always do as well here at home with all facilities for illumination at our service.

$225,000,000 in crops were raised in Washington in 1919. The Columbia basin project will almost double the arable acreage of the state.

HELP WASHINGTON
PUT IT OVER

The Desire Store

BY H. B. ROGERS

(A certain Washington dealer has dared to rival the neighboring jeweler in beauty of shop arrangement and display of his wares. This fascinating description of the entire store from lamp counter to fixture room is told by the local manager of the Spokane Pacific States Electric Company, who firmly believes that the electrical store should hold a place as the most charming and commandingly beautiful of all retail stores.—The Editor.)

Believing that the electrical store should not be simply a place to purchase things electrical but that it should create a definite desire for certain articles in the customer's mind, a certain electrical dealer of Wenatchee, Washington, has opened a shop which might well be called the 'Desire Store' because it caters to the individual's natural desire for beautiful as well as useful electrical goods in the home and because through artistic arrangement it definitely creates a desire for certain articles in the mind of every passer-by.

Each appliance in the shop of the Electrical Supply Company of Wenatchee, Washington, is connected with a convenience outlet and placed as though it were in the home. The French doors lead to the fixture rooms and the roomy mezzanine is used for displaying shades and for the business offices.

The electrical appliances in this Electrical Supply Company store are so placed that the application of each is shown in a practical demonstration of just how one should use electrical service to make it a willing and silent servant.

Furniture, fixtures and hangings have been planned so as to make a contrast especially pleasing to the eye. Each appliance is connected from a convenient outlet and placed in the correct position in the store, just as it should be placed in the home.

Treatment of Display Windows —

The trim of the broad display windows is changed every other day, one appliance and one only being shown at a time. For instance, on a particular day vacuum cleaners only are shown.

A policy which Frank Smallidge, head of the company, claims as one of his largest assets, is that of selling only one make of each article. Merchandise that is backed by national advertising and reputable manufacturers is chosen and then, by consistently hammering away on this one make, the merchandise is made an integral part of the store.

Arrangement of the Interior —

When entering this store one is not bewildered by a mass of merchandise or fixtures hanging from the walls and ceilings, but is pleased with the beauty of arrangement in every section. If a bracket is shown it harmonizes with the surroundings and is so placed, not as much to display the bracket as to demonstrate the fact that a bracket is needed there.

The store is lighted, not with fixtures suitable for a bedroom, but with fixtures chosen for this store and for this one only; they are not samples, but permanent designs chosen for illumination and are noticeable for their simplicity and beauty.

French doors with cretonne hangings lead to the fixture rooms. Entering these one does not see a mass of metals but rather a few very well selected designs, finished to harmonize with everything in the room. Realizing that all do not agree on color schemes, the designers of the shop have provided two of these rooms, so decidedly contrasting as to color that the customer can match fixtures in either a dark or light room.

The men of this shop have learned that the customer does not buy fixtures but that they must be sold. Their predominating fixture room idea is, that the little niceties make the larger sales.

The Kitchen Display Room —

This store has a complete electric kitchen, with range, water heater, dish washer and food grinder, permanently arranged for the ideal kitchen. There is also a 52-gallon tank, lagged, always hot, and a range always ready for service. Cooking demonstrations held here result in a steady sale of electric ranges. So closely is the 'one make' policy followed that the store will not order other makes. "We give service on these goods," they state. "We believe through them we can give better service to our trade and make more money for ourselves."

A roomy mezzanine runs on two sides of the store and the office is located at the rear of the same. This mezzanine is used for displaying shades and has the appearance of a balcony running over the fixture rooms.

The Lamp Counter —

The lamp counter is at the rear of the store and all lamps are kept in cases, where they are out of sight, except when being shown. Each purchaser of lamps must walk the complete length of the store before arriving at the lamp counter and in so doing he must pass all displays. Naturally there is some one thing in which that person is interested. Thus this well nicknamed 'Desire Store' plays upon the half-formed desire already in the customer's mind.

Novelties in Lighting

BY M. LUCKIESH

(The rise of the electrical home idea has given an extra impetus to novel and artistic lighting effects in the home. The dealer, the contractor and the home-builder will find interesting ideas in the following suggestions by the director of applied science at the Nela Research Laboratory.—The Editor.)

Although lighting-fixtures, in the ordinary sense of the term, can be purchased or made to meet the requirements of lighting in the home, the possibilities of novel effects are as various as the details of houses, and the taste and means of householders. For this reason it would be an endless task to cover this subject fully. However, it should be of value

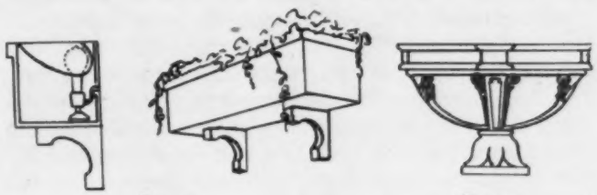


Fig. 1. Fig. 2

The dining room or enclosed porch is given a certain out-of-doors charm by the imitation window boxes shown to the left and the odd corner is transformed when lighted by an urn such as the one shown above.

to read of a number of expedients which have been utilized with success. Some of these are very practicable, and should find much wider use in homes; others are of such a special nature that the descriptions may be useful chiefly in suggesting solutions of different problems. Even in the small house there is room for novelties, but in the larger houses an ingenious architect can weave into the structure various novel effects which will be a source of constant interest and pleasure. Naturally, color plays a conspicuous part in lighting novelties.

There is a long span between the common fixtures, such as ceiling fixtures, wall brackets, and portable lamps, and the constructed places for concealing lamps such as cornices of rooms and capitals of pilasters and columns. The latter are no longer novelties in lighting, many applications of this type of 'concealed' lighting having been made in large interiors. However, little has been done in the home in this direction, so that even cove-lighting may be considered novel. But between these two extremes there are many possibilities.

Wall Boxes

Such a room as the sun room, or even a dining room of appropriate type, may receive its secondary general illumination of moderate intensity from wall-boxes. These may be imitation flower-boxes from which artificial foliage protrudes. The lamps may be concealed in a box such as that illustrated in Fig. 1, and reflectors may be used for distributing the light evenly upon the ceiling. However, if it is desired to have a box of the smallest possible dimensions, the reflectors may be dispensed with, and the interior of the box provided with a white coating. White paint containing oil or varnish is undesirable for this purpose, for when in close proximity to operating lamps it scorches and becomes brown. A 'water' white coating serves well for this purpose and there are many products of this character available which are improvements upon the old-fashioned 'white-wash.' In such a wall-box, tinted or deeply colored lamps may be concealed, and colored effects may be readily obtained. Such boxes are easily installed in houses already built by providing wall-receptacles. Switches may be placed on the boxes, and the connections made to the wall-receptacles by means of ordinary connecting plugs.

An urn such as that illustrated in Fig. 2, or a large vase, can be bored near the base for inserting

Fig. 3 Fig. 4 Fig. 5

The portable urn-pedestals shown in Figure 3 afford excellent places from which to obtain generally diffused light. The piano or bookcase corner is greatly improved by the illumination device shown in Figure 4, while a modification of the wall-box is shown in Figure 5.

the necessary wires and a lamp and reflector can be installed very easily. If the converted device is placed upon a pedestal or article of furniture so that its upper aperture is about six feet from the floor, very satisfactory indirect-lighting is obtained. Combination urns and pedestals such as illustrated in Fig. 3 are convenient portables. For the home a single reflector and lamp will usually be sufficient but for large rooms the urn may be large enough for several reflectors. These devices afford excellent places from which to obtain generally diffused tinted light and even striking color effects for special occasions. Several small fixtures of this character may be used in a large room.

There are many kinds of portable objects in which a reflector and lamp may be concealed. In Fig. 4 is illustrated a small ornamental object devised to conceal a lamp and to set upon the piano, mantel, or bookcase. A modification of the wall-box or of the smaller ornament just described is illustrated in Fig. 5 by means of internal and external

35,000 new homes are required to meet the needs of Oregon's increased population. If twenty outlets were placed in each of these homes, this would mean a business to electrical contractors of that state of $3,500,000.

HELP THE NORTHWEST ELECTRIC SERVICE LEAGUE PUT IT OVER

views. This device contains a reflector and therefore is fairly large although it can be made to project only three inches from the wall. If it is built as a part of the architectural design there is no reason why a cavity in the wall may not be provided to minimize its projection. These can be used in various

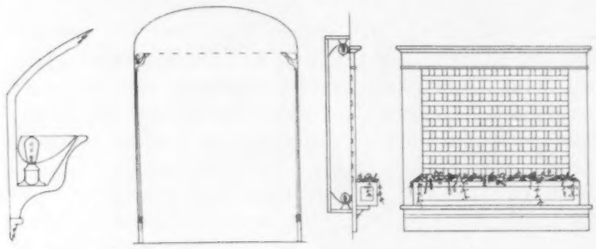


Fig 6 Fig 7

The unavoidable dark and gloomy corner can be converted into a charming spot through the artificial skylight arrangement shown to the left and the undesirable view can be replaced by a glowing window as shown in Figure 7.

places such as vestibules and hallways for primary lighting. They can be employed in the sunroom and dining room as secondary lighting effects.

Projections for concealing lamps for the system known as cove-lighting must be a part of the architectural or decorative scheme. In large interiors such projections may be large enough to provide space for reflectors but in the smaller room, ingenuity must be exercised to make such a device of small projection. Reflectors may be dispensed with and a cavity provided in the wall. This may be backed with metal lath and plaster and the clean surface of the plaster may be utilized as a reflecting surface. A cove for concealed lighting is shown in Fig. 6.

Artificial Skylights

Artificial windows and skylights have their applications in the home, and a number of these have been installed. It is easy to make such a window if there happens to be a window which is useless or undesirable for admitting daylight. The window-sash may be removed and placed on the extreme exterior of the frame where the storm-sash is ordinarily installed. This may be covered on the inside by means of cardboard, composition-board, asbestos-board, or any other suitable material. At the extreme interior of the frame a lattice or decorative glazed sash may be installed. If the former is used, an artificial vine climbing upward from a flower-box may be entwined in the lattice. Lamps may be installed as shown in Fig. 7 and a charming effect is obtainable. If bluegreen lamps are used, moonlight is simulated with satisfactory results. The desired color may be obtained by tinting the lamps, by using colored glass over the reflectors, or by tinting the background which covers the inner side of the exterior sash. If satisfactory results are to be achieved by coloring the background, the latter must be confined to it. A uniform brightness of the background may be obtained by shading it by means of a brush and suitable gray coloring.

A small alcove or vestibule isolated from daylight may be provided with an artificial skylight, or such an expedient may be resorted to deliberately in preference to ordinary fixtures. A cove may be built about two feet from the ceiling depending upon the height available, and the ceiling may be curved as shown in Fig. 6. A sub-daylight of glazed sash or merely of lattice may be installed as indicated by the dotted line in the diagram. In a vestibule where the height will not permit of a suspended fixture owing to interference from a door when it is opened, a small skylight may be installed flush or close to the ceiling. Behind this a white box or reflector can be provided with suitable lamps. Such devices may be placed in the ceiling above a window-seat or in any appropriate nook.

In one large residence a large oval of diffused glass made of leaded panels was set in the ceiling of a dining room. Above this panel a large number of lamps were installed in a recess specially provided for the purpose. In this particular case, red, green, and blue lamps are used in three circuits respectively. These were controlled by means of separate rheostats set in the wall at a convenient place. By varying the intensities of the three circuits, various tints can be obtained.

Light for Emphasis

A miniature of a folding screen may be mounted upon a pedestal to surround a light-source on three sides, the open side being the one nearest the wall. Such a fixture will vary from about three to four feet and can be used to illuminate a painting or other important object. It has the advantage of doing this apparently casually, whereas the chief objection to fixtures specially mounted for illuminating a painting is that their purpose is often so obvious as to be obtrusive. A similar lighting effect may be obtained by means of a lantern on a pedestal, the lantern having a panel with clear or slightly diffusing glass, or even without glass. Such fixtures provide a novel distribution of lighting somewhat simulating that of daylight from windows.

The foregoing idea may be modified by providing for better control of the light, even to the extent of using small reflectors or spot-lights. If such devices can be concealed they may be used to 'spot-light' important or interesting objects. A mirror may be placed in a proper position on a suspended bowl or at the top of a portable lamp, so that a beam of light is reflected to a picture or other object. Several mirrors may be used on the same fixture for illuminating several objects.

Useful Practical Devices

There are many special devices applicable to the home which have a utilitarian purpose. The chief difficulty encountered is to find these devices upon the market. Many of them have been made and installed according to specifications in the particular case, or by individuals who saw their advantages and took the trouble to have them made. A description of a few of these may suggest solutions to other specific problems.

A small lamp installed in the proper place in the modern phonograph for illuminating the needle while it is being adjusted is a convenience which after

using becomes a necessity. There are several easy methods of installing it. A small lamp of standard voltage and candelabra base may be installed in a reflector with a convenient switch for controlling it. In fact, the switch may be controlled by the closing and opening of the lid of the instrument. The bell-ringing transformer is now available at a very low cost. This may be concealed in the case of the instrument and connected with a miniature lamp fastened to the mechanism and illuminating the needle. In fact, the lamps and reflectors used on the instrument-boards of automobiles can be adapted very easily to this purpose.

As a matter of safety, lighting devices are used to illuminate steps which are ordinarily dangerous. Usually a small fixture containing a lamp is embedded in the structure, flush with the surface. Such a device set in the door-casing outside the entrances of the house, at a height of about four or five feet, is a safeguard for the housewife. By controlling it on the inside, she can clearly distinguish the face of the caller when desired. These would be useful only when a fixture is not available, or cannot be installed in the proper location.

Everyone has experienced the annoyance of searching for a house-number at night. How much satisfaction it would be to have house-numbers illuminated. To operate the lantern at the entrance for several hours every evening is unduly costly, and in most cases would not adequately illuminate the number. It is easy to devise a small metal box containing one or two miniature lamps connected to the bell-ringing transformer. The number can be painted upon a diffusing glass and protected by a clear glass which forms the cover of the box. If the lamps are operated below their normal voltage the amount of electricity they will consume is almost negligible. Furthermore, the lamps will operate for years before burning out. If desired, a time-switch can be provided for controlling this device.

Those who become interested in lighting will be surprised to learn how many switches, sockets, and other lighting accessories are available to be adapted to the needs which arise. Simple flashers for producing lighting effects automatically can be obtained. Sockets in which a dimming device is incorporated are available for night-lights in the bathroom, hall, or sick-room. If it is desired to 'turn down' a pair of candlesticks or two other lamps, a switch can be obtained which will place them in 'series' and will also make it possible to burn them at their normal brightness in 'parallel' when desired. 'Pilot-lights' are convenient to show when an electric flat-iron or other electrically heated device is in operation. Such conveniences are appearing on the market. Although lighting is inexpensive because of the few hours during which it is in use each day, a lamp which burns for a week in the attic will add materially to the lighting bill. For example, a 25-watt lamp operating for a week will cost the householder from 20 to 40 cents, depending on the rates. Indicating switches or pilot-lights in convenient places might be worth while as indicators of lamps and other devices burning unnoticed.

WIRELESS APPARATUS FOR THE ELECTRICAL DEALER

BY LOUIS ETSHOKIN

(Wireless telegraphy is rapidly becoming our national indoor sport, and for this reason the progressive electrical dealer will make his shop a wireless supply center. The wireless boy can bring a remarkable number of general electrical sales to the dealer he knows and likes. And for this reason as well as for the pure merchandising profit which can be made, the dealer will find it well worth while to handle wireless apparatus.—The Editor.)

Wireless telegraphy was stimulated by the war, more than any other one phase of electrical development. Not only was a remarkable advance made in the science itself, but interest on the part of the general public was greatly increased. Prior to 1914 most people knew of Marconi and were familiar with the meaning of S. O. S. Nevertheless the public in general was not vitally interested in the subject of radio and very few electrical schools gave wireless courses.

Then with the war wireless telegraphy began to attract attention. The public learned that there had been regular trans-oceanic wireless communication by German stations as well as by Marconi ones. Wireless was among the important "winning the war" factors and for this reason was a subject of national interest.

Just previous to this time, great improvement had been made in wireless reception so that long distance messages could be received with a small aerial. This made many private wireless stations possible and in a short time there arose a great body of young radio disciples or "fans," as they were called. When, with the war, the demand for operators grew from the hundreds into the tens of thousands, the ex-amateurs formed the backbone of the army and navy and radio signal corps. But even these were not enough to supply the demand. The rest had to be trained. The Naval Radio School at Harvard, alone, had nearly five thousand men.

Present Radio Interest —

Now with the close of the war, we find a tremendous supply of trained wireless operators in every section of the country. Most of these men do not want to get out of the wireless game. They have found it too fascinating to drop, and furthermore, their younger brothers are rapidly acquiring the wireless fever. There used to be a few wireless enthusiasts. Now there are few boys who are not wireless enthusiasts.

The electrical dealer can test this out by asking the boys who come into his store if they are interested in wireless. The result will most likely be surprising. A look around any neighborhood for wire-

909,508,000 people live in the countries bordering the Pacific Ocean. The supplying of a great part of their needs belongs to the western seaboard of North America.

HELP THE PACIFIC COAST
PUT IT OVER

less antennæ confirms the statement that wireless is America's indoor sport as baseball is her outdoor sport. Both are in keeping with the keenness and intelligence of American boys.

There is, therefore, an ever increasing field for the electrical dealer in handling wireless supplies. He is the logical salesman, since wireless can properly be classed as an electrical application.

The Wireless Boy's Influence —

Furthermore, the electrical man who handles wireless apparatus will gain the friendship of most of the boys in the community. And these have the power to determine a great many general electrical sales. When an electric percolator or vacuum cleaner is contemplated by some member of the family, is not Johnny, the electrical expert, referred to as official advisor? A chap who hears to Honolulu every day is generally considered an authority on electrical appliances.

And so the wireless youngster's respect is well worth having. He is the electrical point of contact between the home and the dealer. In a few years he will be having his home wired and will be buying appliances for himself. The wise electrical dealer will get him used to coming into his store.

Then there is a good profit in wireless apparatus from a purely merchandising point of view. It is not bulky. A small show case will hold a fairly complete stock. It always is a good looking display, and featured in a window it is a good advertisement, since it stamps the dealer as a progressive man.

Electric Heating

BY T. D. MacMULLEN

(The problems of electric heating have been the subject of much discussion in the electrical industry, both from the power company's standpoint and from the standpoint of the dealer in electrical heating devices. The following discussion of some of the principles involved is by the secretary and sales manager of the Majestic Electric Development Company.—The Editor.)

There are two methods of heating electrically, and because of the disadvantages of the older method the newer one seems to be the subject of some prejudices in some quarters. When heat is figured on a wattage basis and the engineering formula, including cubic dimensions, degree of temperature obtained, and amount of current consumed, the cost of heating runs high, unless the rate be a very low one. When current is merely consumed and the heat given off into the air, electrical heating is no more efficient than coal, gas, or steam. Heat is developed in some heating devices, and the warmed air surrounding the device rises to the upper part of the room, and, gradually working downward, expels or warms the cold air, and eventually the lower space is heated. The degree to which it is heated depends, of course, on the size of the room, the wattage used and the initial temperature. There are also several secondary matters, such as the composition of the walls, the height of the ceiling as related to the other dimensions, the amount and character of ventilation, the exposure of the room (that is, whether the room faces the weather, whether it is located at the top or bottom of the building, whether it is an inside or outside room, etc.), the number of occupants of the room, and many other factors.

The usual method of figuring has been a very rough one necessarily, but it has been assumed that two watts per cubic foot per degree rise in temperature would warm a room in ordinary conditions to a comfortable degree. It can readily be seen that this is not a satisfactory way of figuring, but it applies in a general way and estimates of heat requirements are vague at the best, because of all the conditions that have to be considered, as outlined above.

Heating By Reflectors

About six years ago the development of electric heat on the principle of reflection was introduced. It increases the efficiency of the fuel consumption to an enormous extent, and permits the throwing of heat rays to any part of the room without the necessity for first, or ever, heating the upper part, and without the necessity for making any allowance for ventilation or the other usual conditions that have to be overcome. When light is placed in front of a reflector the rays can be thrown many miles. When heat is used in a similar manner the amount of current ordinarily used in a room—600 watts—can be made to warm an entire section of a room where people may be grouped, and in a few minutes it will warm the whole room. The effect of this method of heating is not to warm the air so much as it is to warm the objects against which the heat is reflected, whether people in the room, or the walls or floor. The sun does not warm us indirectly by warming the air. It warms us with its direct beams, and if the direct beams are shut off we are cool. The sun also warms the earth, of course, and by radiation or reflection from the earth the air is warmed and everything upon its face. If we insist on figuring electric heat efficiency under the formula mentioned heretofore, we will get from 600 watts the amount of heat we get from a flat iron, and it would take just as long to warm a room as it now takes a flat iron to warm a room. Under the later method of portable reflector type of heaters, we get immediate heat wherever we want it, and an ordinary sized room is warmed in a few minutes. This same type of heat is arranged for in larger wall heaters resembling fireplaces, made in several sizes and in wattages ranging from 1200 to 3000. A 1500 to 2000-watt heater will warm a large room in a few minutes. A 3000-watt heater will warm a large hall in the coldest climate.

Economies and Comforts of Electric Heating

Electric heat, as compared with any other type of heat, stands out as favorably as the electric light compared with the oil lamp. With most of us the

thought of warming our house instantly suggests labor and dirt, and a heavy atmosphere. The oil stove entails the messy filling of a heater from a dirty oil can, with oil on the floor and furniture and a heavy smell pervading the house for long afterwards, and the lighting of the stove is but a continuance in another form of these objections. If a window is opened a little of the odor passes out, but so does all of the heat.

Coal and wood fires are pleasant to look at, and ever desirable, regardless of objections; but of the great mass of people, how many do not look at a fire in a grate and reflect that some one has had to haul in wood and coal, and that some one will have to clean out ashes and scrub the mantel and dust the furniture the next day? And there is always the uncertainty of the coal supply, as for instance during last winter.

Steam, or hot water heating, is out of the reach of most people, but when it is used it is either developed from an uncertain oil or coal supply, or it is brought from the basement furnace, and there is the coal situation all over again, and the necessity for night and day attention. Heat from these radiators has to be provided for hours sometimes before it is wanted, and who, on coming in late in the evening, would not prefer going to bed without heat to going into the cellar to stoke a furnace and then wait for the heat to come?

And with all of these types of heat there is waste on every side, in the stove or furnace, up the flue and in the room, and through ventilators. Reflected electric heat takes but a turn of the switch and it is there instantly.

Gas and Electricity

At the recent Pasadena Convention there was considerable discussion of electrically heated furnaces for industrial purposes, and some emphasis was laid on the revenue the power companies were deriving from this source. The writer took occasion to bring up domestic heating in this connection. The revenue to the power companies is not always a consideration, as during the power shortages additional loads are not attractive. Also, it is too often the case that the power-and-gas company is too anxious to retain its rapidly diminishing gas business in the realm of heating and exploits the gas to the detriment of electricity. I think a point should be made of this, and something of a campaign undertaken to bring the gas-and-electric companies to a point where they will consider their electric business on its own merits, and if it is the will of the public and the destiny of the gas business that the gas business be eliminated, the power company should not make the electric business dance to its tune. Too often, even where heating rates are established by regulatory bodies, the power companies find ways of refusing such rates to the public by claiming no facilities, etc. This, of course, applies to the companies who are urging their gas business in preference to electric, and I think a suggestion that heating rates be made more attractive and that the companies reverse their attitude and seek heating business, would mean that in a few years this great problem of national importance would be solved.

The country is lighted by electricity, the factories are run by electricity, railroad lines and now ships are using it, and with heating and cooking accomplished electrically we shall have an electrical nation. It is sure to come and no one in the industry should obstruct it, but rather publicly and privately hasten it.

Western Ideas

YOUR NEW HOME is your best publicity feature. An effective sign over the doors even weeks before they open will acquaint the public with your new situation and arouse curiosity as to the appearance of the new shop.

The Western Gas and Electric Appliance Company of California took advantage of moving time by advertising their new home well in advance.

MERRY CHRISTMAS is the one time you have a chance to play with the company's kiddies. Any employe will appreciate a good time for the kiddies more than any other courtesy the company could extend.

This is a picture of the 1919 Christmas party given to the younger members of the British Columbia Electric Railway Company, Vancouver, B. C.

$597,149,796 in foreign commerce passed through the Port of Seattle in 1918. Seattle, through her remarkable port facilities, is helping to build up West Coast trade with the Orient.

HELP SEATTLE
PUT IT OVER

Pamphlets and Clippings in a Business Library

BY VIRGINIA FAIRFAX

(What do you want to know? Business and scientific information that it would take you years to discover for yourself can be had for the asking if you know where and how to ask. In the second of a series of articles the librarian of the Carnation Milk Products Company, Chicago, discusses governmental and other publications for commercial and technical men. Permission to reprint from this series must be obtained in writing from the Journal of Electricity.—The Editor.)

THE SOURCES AND SELECTION OF MATERIAL — PART I.

Every progressive business organization aims not only to avoid hasty judgments but also to expand and develop its business on a permanent basis, explore new commercial avenues and detect the course of competition. In order to accomplish this end, a systematic collection of accurate business facts must be made and intelligently used.

Periodicals and National Commercial Organizations

Every business man should keep himself informed and up to date on matters that pertain to his special business interests by reading his local newspapers, possibly one or more out of town financial and commercial papers, and by reading the periodicals of his specific trade, business, or profession. The engineer, be he civil, electrical or mechanical, receives the various periodicals that pertain to his special calling; the lumber man, the oil man, the coal man, the export man, the banker, each have their special journals as do all other lines of business.

In addition to the newspapers, financial, trade and technical periodicals, the clipping and filing of which will be discussed in a later article, each of these special classes of business men receives from the technical, trade or commercial organizations to which they belong, bulletins, monographs and reprints written by authorities, and containing the last word on processes, surveys, investigations, laws, results reached in the thousand activities of the world's work, and without which sources of information the workers of today could not keep sufficiently informed.

For example, the electrical engineer in business reads, or his librarian reads for him, some, if not all, of the following periodicals: the Electrical World, the Journal of Electricity, the Electric Journal, the General Electric Review, the Electric Railway Journal, and the journal of his technical society, the American Institute of Electrical Engineers. From the national commercial association of his industry, the National Electric Light Association, he receives a monthly bulletin containing up-to-date facts and figures on the electrical industry. He may also avail himself of the small periodical entitled "Rate Research," published weekly by the National Electric Light Association, which gives all the latest commission decisions with extracts from articles on subjects which bear upon electrical rates. The National Electric Light Association also issues for his benefit the "N. E. L. A. Rate Book," with three quarterly supplements, which gives him electric light and power rates in force in all cities of 25,000 population or over. He also receives in pamphlet form from this association the important papers and reports of committees which are presented at the annual meetings of the Association and which later appear in bound volumes. All other special classes of business men are aided in their special industries by their periodicals and commercial associations just as the electrical man is aided in his particular industry.

A fairly complete list of "Commercial and Industrial Organizations of the United States" with data about each organization, including the address of the secretary, revised to November 1, 1919, has been issued by the Bureau of Foreign and Domestic Commerce (Miscellaneous Series No. 99). It may be purchased from the Superintendent of Documents, Washington, D. C., for 15 cents, or may be obtained from the local office of the Bureau of Foreign and Domestic Commerce, established in some of the larger cities of the United States.

References to some of the most valuable material to be obtained for the information files is scattered here and there in the text of periodicals. Lists of pamphlets under such headings as "New Trade Publications" and lists of advertisers and classified lists found among the advertising pages should not be neglected as possible sources of value. It is essential in a business house that the information files be administered by a trained librarian who knows how and where to look for material of interest, and who watches for announcements of new publications when reading periodicals and newspapers in search of business facts.

Pamphlets Issued by Banks

Many of the banks of the United States issue regularly very valuable bulletins containing trade and financial information, and are most generous in sending their publications gratis to business houses requesting them. Some of these banks are the following:

The National City Bank of New York
The National Bank of Commerce in New York
The Irving National Bank, New York
The Guaranty Trust Company of New York
The National Shawmut Bank of Boston
The National Bank of San Francisco

Most of these banks print a list of their publications which they will send to business houses from which a selection may be made. Other banks, such as the Continental and Commercial Banks, Chicago, print their publications only occasionally and these will be noted in reading the newspapers and periodicals.

Chambers of Commerce at Home and Abroad

The Chambers of Commerce in various cities of the United States, organized to promote commerce and advertise their communities, are excellent sources of information. Foremost among these is the Chamber of Commerce of the United States at Washington, D. C., which has an exceptionally fine information bureau.

Any business organization interested in foreign trade will find valuable sources of information in the American Chambers of Commerce established in foreign countries, a list of which with addresses can be had from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the branch offices of that bureau in various cities of the United States. These Chambers of Commerce will furnish data pertaining to their foreign localities.

There are also foreign Chambers of Commerce or Associations with offices in the United States, such as, The Argentine-American Chamber of Commerce, the Chinese Chamber of Commerce, the American-Asiatic Association, the French Chamber of Commerce, and many others, which are prepared to furnish trade information of their respective countries. A list of the foreign Chambers of Commerce established in this country may be obtained, with their addresses, from the Bureau of Foreign and Domestic Commerce.

The International Chamber of Commerce, formed in Paris in June, 1920, plans a complete and reliable information and statistical bureau for international trade available for all interests and countries.

Pamphlets From the United States Government

The departments of the United States Government operating through their various specialized bureaus publish in pamphlet form or mimeograph sheets, information that every business man should obtain and use. To become familiar with this large amount of pamphlet material which has been issued and is constantly being issued is not an easy task, and to select the pamphlets applying to a particular business, requires a large knowledge of Government resources, which the trained librarian can supply to the business house.

The best method of keeping posted on what the Government is publishing is to obtain the printed catalogs of publications that have been issued by the various departments and bureaus, and supplement these by subscribing to the "Monthly Catalog of Government Documents" obtainable from the Superintendent of Documents, Washington, D. C., price 50 cents per year, which records all pamphlets issued each month by all departments and commissions of the Federal Government.

The following is a select list of the printed catalogs of the pamphlet material issued by the various departments and bureaus of the Government which are especially useful in business, and which will guide in selecting pamphlets and tell which ones are free for the asking and which ones must be paid for.

U. S. Department of Commerce

This department issues a yearly list of publications with a monthly list of additions. It maintains a mailing list of people who ask to have this catalog and the monthly additions sent to them. This list of the Department of Commerce contains the publications of its bureaus, three of which are of special interest to business, namely, the Bureau of the Census, the Bureau of Foreign and Domestic Commerce and the Bureau of Standards. Each of these bureaus issues a separate list of its own publications which may be procured from the bureau if desired. The catalogs of the Bureau of Standards and the Bureau of the Census give very full annotated descriptions of the contents of their pamphlets, which are not given in the list issued by the Department of Commerce. They also record publications out of print, but that may be seen at the Public Library, and aim to be a complete catalog of everything that has ever been issued by that particular bureau. They do not, however, issue current lists of new publications, so that the monthly supplements issued by the Department of Commerce covering their publications is of value. The "Monthly Catalog of Government Documents" also covers their current publications.

Emphasis should be placed upon the value to business men of the publications of the Bureau of Foreign and Domestic Commerce and the Bureau of the Census. The Bureau of Foreign and Domestic Commerce is an indispensable source of information for firms engaged in foreign trade, and it is also prepared to give data of value to those engaged only in domestic commerce. It issues "Daily Commerce Reports," a valuable pamphlet that contains important financial, commercial and industrial news and statistics gathered from all parts of the world by the American Consular officers and Commercial Agents of the Government. Its price is $2.50 per year from the Superintendent of Documents. This bureau not only furnishes printed pamphlets but also issues advance trade information on mimeographed sheets. From it also may be had lists of importers in foreign countries of various American products and manufacture.

The Bureau of the Census furnishes for business use, statistics not only of population but also of manufactures and special industries, and agriculture in general. Statistics of cotton production and consumption are issued frequently during each ginning season, and statistics of tobacco production are issued quarterly. It compiles, every five years, reports on electric railways, electric light and power stations, telephones and telegraph business. An ex-

$25,000,000 more agricultural products than mining products were produced in Montana in 1918. The great wealth of the state in its farm lands is being made available through its irrigation plans, including electrical pumping.

HELP MONTANA
PUT IT OVER

amination of its catalog of publications will show many other important statistics which the business man may use with great profit.

U. S. Geological Survey

This department issues a yearly list of publications with a monthly list of additions, sent free on request. Among its wide range of pamphlets of interest to business men should be noted particularly its statistics on mineral production and petroleum and natural gas resources of the United States. The petroleum statistics are issued each month on mimeographed sheets, and the Survey also issues monthly statistics on "Production of Electric Power and Consumption of Fuel by Public Utility Power Plants in the United States." This department of the government is also strong in information dealing with water power resources.

U. S. Bureau of Labor

This bureau issues a catalog of publications semi-annually but does not issue any monthly list of additions. These will be found, however, in the "Monthly Catalog of Government Documents" which has previously been mentioned, and also in its excellent monthly periodical entitled "Monthly Labor Review," price $1.50 per year from the Superintendent of Documents. This Review, in addition to articles and statistics on industrial conditions in different parts of the world, contains, as an appendix, a list of references to pamphlets and books on labor questions published in the United States and foreign countries. The pamphlets and reports issued by this bureau cover conditions of labor in industry, such as hours, wages, employers' liability, also cost of living, wholesale prices of commodities, labor laws, etc.

U. S. Bureau of Mines

This bureau issues quarterly a new edition of its catalog, each issue bringing the complete list up to date. It also issues a monthly list of publications on a postal card which is sent free on request. Pamphlets issued by this bureau cover not only what is implied in the name of the bureau but they also cover the utilization of all mineral resources, such as coal, fuel oil, natural gas, etc. They are valuable to every business man who is concerned with the problems of burning coal and fuel oil, using or selling natural gas, or engaging in the petroleum industry.

U. S. Department of Agriculture

This department does not issue a complete list of its publications but it does issue a monthly list of publications covering the pamphlets issued by all its bureaus. But there may be had from the Superintendent of Documents, free of charge, some "Price Lists" on special subjects which have been treated in pamphlets issued by the various bureaus of the Department of Agriculture. These Price Lists are really lists of bulletins arranged by subject and giving the price of each. For example, there are Price Lists on Farm Management, Weather, Foods and Cooking, Forestry, Animal Industry, Soils and Fertilizers, etc. The publications of the bureaus of the Department of Agriculture are useful to farmers, packing plants, dairy industries, lumber men, dealers in seeds and many other special lines of business. The statistics and other pamphlets issued by the Bureau of Markets of the Department of Agriculture are also very useful.

Last August (1920) there was created by the Department of Agriculture a new office in the Bureau of Chemistry, called the Office of Development Work. The staff of the new service is made up of engineers who will translate the valuable discoveries of the chemists concerning the utilization of manufacturing waste, or a new dye, or glue, or preservative, etc., into terms that can be understood by the manufacturer and investor.

It is not possible in the space allotted to this article to discuss further the value of government pamphlets to business men, but enough has been said to emphasize the fact that pamphlets issued by the government are invaluable sources of business information.

Should any business man desire to acquaint himself fully with the duties of the various departments of the government and the scope of their publications, reference should be made to "Swanton's Guide to United States Publications," which has been issued as Bulletin No. 2, 1918, of the Bureau of Education, and may be bought from the Superintendent of Documents for 20 cents. The Superintendent of Documents also issues free of charge besides those mentioned in connection with the Department of Agriculture, a large number of "Price Lists" on various subjects that have been treated in the pamphlets issued by the different departments of the government. For example, Price List 25, Transportation, lists pamphlets, reports of commissions, reprints, relating to railroads and shipping problems, postal service, telegraphs, telephones, government ownership and control, that are for sale by the Superintendent of Documents.

THE TELEPHONE IN SOUTH AMERICA

A survey of the telephone and telegraph systems of all the countries south of the Rio Grande has just been completed by the American Telephone and Telegraph Company with the aid of the various governments. This shows that only one telephone for about 300 population is found in the whole area, as compared with 34 for every 300 population in the United States. Argentine leads with 105,205 telephones, or nearly a third of the total. The other countries having more than 10,000 telephones are Brazil, Mexico, Cuba, Chile and Uruguay. It is evident that there is opportunity for much development in South America before the telephone is made the universal means of communication that it is in the United m means of development that it is in the United States.

Of the total telephone and telegraph earnings in 1918 in the Latin countries, the telephones brought in only 43.3 per cent of the total and the telegraphs 56.5 per cent. In the United States this situation is strikingly reversed — 80.8 per cent from the telephones and 19.2 per cent from telegraphs. The total telegraph wire mileage is 433,938 there and 1,900,000 here.

Problem Course in Electricity

BY H. H. BLISS

(Do you understand your motor? the relation of its construction to its capacity? The principles of magnets are described in the following article, the eighth of the series on practical electricity, which shows how to perform the simpler calculations with flux, losses and ampere turns. The author is on the staff of the Riverside Junior College at Riverside, Cal.—The Editor.)

MAGNETISM

Theory of Magnetism.—When a bar of iron or steel becomes a magnet it is supposed that the tiny particles of which it is composed are more or less aligned to point in one general direction. When the bar is demagnetized the "molecules," as the particles are called, are released and point in all ways; and if it is remagnetized so that the poles are reversed, they are aligned again, pointing in the opposite

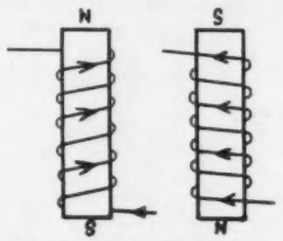


Figure A. Diagram showing how the polarity of a magnet depends upon how the current goes around and not how it goes along the magnet.

direction. In soft steel and iron they turn easily, so that such metals are readily magnetized and demagnetized. In hard steel the molecules turn with difficulty. Hence a magnet of hard metal cannot be made so strong as one of soft metal; but since it keeps its magnetism well, hard metal is used for permanent magnets. In many electrical machines, including motors, generators, and transformers, some parts are magnetized, demagnetized, and remagnetized in the reverse direction many times a second. This requires the expenditure of energy in turning the molecules; the wasted energy is called the "hysteresis loss."

Any piece of iron or steel in the neighborhood of a magnet is affected by the "magnetic flux" or "lines of force," becoming itself a magnet. The point at which the flux enters any magnet, temporary or permanent, is called its "south pole," since this end points southward if the magnet is suspended free to turn. The flux is considered as passing through the metal of the magnet, issuing from the "north pole," and making a complete closed circuit through the air or other materials on the way to the south pole.

Electro-Magnets.—A coil of wire with an iron core forms an "electro-magnet." Before current flows the iron shows no evidence of magnetism—it will not pick up pieces of iron or repel a compass needle. But when a current of electricity is made to flow through the coil, **around** the iron, the iron acts in all ways like a magnet. Note that the current does not flow **through** the iron; the core is generally insulated from the wire.

As soon as the current is stopped, the iron is found to lose practically all its magnetism. For lifting bars or irregular masses of steel, for separating iron particles from mixtures such as ores, for attracting and releasing the vibrating arms of telegraph sounders, buzzers, and electric bells, the ability to let go is as valuable as the ability to pull. Electro-magnets are often operated from a distance, as in the control of lamps and elevator motors and in signaling.

Furthermore, electro-magnets can be made much stronger than permanent magnets of the same size and weight, and their strength can be varied at will. Hence they are used in nearly all generators and motors, as we shall find in future lessons.

With an electro-magnet the flux or number of force lines depends upon the number of "ampere-turns" in its coil—the number of "ampere-turns" is the product of the number of amperes times the number of turns of wire around the magnet. By increasing the current the flux can be made as great as desired up to the limit of "saturation." (When the flux in steel or wrought iron reaches about

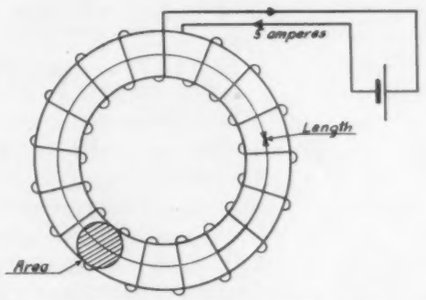


Figure B. Diagram drawn to illustrate the question, How many lines of force will thread this doughnut-shaped coil if the cross section area is 2 sq. inches and the length is 8 in.?

120,000 lines per sq. in. of cross section, the material seems to be saturated, so that increasing the ampere-turns raises the magnetization very little. The saturation limit for cast iron is much lower—about 50,000 lines per sq. in.)

Fig. A shows two simple, bar type, electro-magnets to illustrate the rule for determining "polarity." "Grasp the magnet with the right hand, fingers pointing around it in the same direction that the current flows, and the thumb will point to the north pole." As shown in the sketch, the current may enter the coil at either the N or the S pole.

Heating of Electro-Magnets.—Just as in every other conductor carrying current, the coil of an electro-magnet is the seat of an energy loss, where electric energy is converted into heat. It is evident that this heat must in some manner be removed from the coil, or else in continuous operation the temperature would rise to such a point as to injure the insulation.

In many cases the heat is largely radiated from the surface of the coil, but magnets in generators and motors are exposed to drafts of air which carry away much of the heat by conduction. That which is generated in the interior of the coil has to reach the surface by conduction through the metal and insulating materials, and hence the inner turns are always warmer than the outer ones. Coils for this reason are rarely made over two inches deep if intended for continuous operation.

A rise of 72° Fahr. above the room temperature is about as high as is safe for the external surface of a coil. The highest temperature in the interior is then about 54° above the surface temperature, or 126° Fahr. above the room. It is found that in order not to exceed these figures the power loss in the coil should not be over .5 watt per sq. in. of cylindrical surface. (The area at the ends of the coils is considered zero as far as heat radiation is concerned; the .5 watt is in reality partly dissipated from the ends, but the calculation is simpler if it is all credited to the cylindrical surface.) For field magnets of a dynamo machine the fanning cools the surfaces so that values up to 1 watt per sq. in. can be used for short coils in certain cases. The figures in this paragraph apply to coils about two inches thick, impregnated with insulating compound.

What is the highest voltage which can safely be applied continuously to a stationary coil of 1.8 ohms resistance, 2 in. thick, 8 in. long, and 7 in. external diameter? The periphery $= 3.14 \times 7 = 22$ in.; the external area $= 8 \times 22 = 176$ sq. in. Hence the allowable loss $= 176 \times .5 = 88$ watts. Amperes $\times$ amperes $\times$ ohms $= 88$; amperes $\times$ amperes $= 88/1.8 = 49$, and amperes $= 7$. Hence safe pressure $= 7 \times 1.8 =$ **12.6 volts.**

Calculating Ampere-Turns. — For lifting-magnets, for the poles of generators and motors, for transformers and other electrical apparatus, it is necessary to produce definite quantities of magnetic flux, definite numbers of magnetic force lines. While the definition of the exact meaning of one "line of force" must be postponed for later discussion under "Electric Generators," it is possible here to outline the relations between the total flux and the ampere-turns surrounding the magnet.

Consider the cast of a doughnut-shaped ring made by bending a long coil around until the ends meet (Fig. B). Current in the coil causes lines of force to be set up in the ring-like tunnel (which we will assume has no iron core), and the number will be proportional to the ampere-turns. The larger the cross section area (other things being equal), the greater the flux; the longer the lines, the more ampere-turns will be necessary to produce a given flux. Experiment as well as theory shows the truth of the following relation:

"Flux $\times$ length $= 3.2 \times$ ampere-turns $\times$ area"

where the length is in inches and the section area in sq. in.

By simple mathematical processes, similar to those used in transposing Ohm's Law and other electrical formulas, we may change this expression around to find any one of the factors when the rest are known. For example, if the flux $= 600$ lines, length of average line $= 20$ in., cross section of path $= 4$ sq. in., the ampere-turns are found as equal to flux $\times$ length/$(3.2 \times$ area$) = 600 \times 20/(3.2 \times 4) =$ **940. To get any term standing alone, divide its companions into the other side of the equation.**

Solutions of Transformation Problems

78. Ft. lbs. per minute $= 8300 \times 660 = 5{,}480{,}000$. Divide by 60 and 550 and find hp. output $= 166$. Input to pump $= 250 \times .92 = 230$. Efficiency $= 166/230 = 72\%$.

79. Line loss $=$ **300 watts.** Amperes $\times$ amperes $\times 3 = 300$; hence amperes $\times$ amperes $= 100$, and amperes $=$ **10.**

80. 2,300,000/2,545 $= 904$ hp. hours in 20 hours; $904/20 = 45.2$ hp., average input; $45.2 \times .32 =$ **14.5 hp.**

81. Input $= 100/.90 = 111$ hp. $= 83$ kw. $83 \times 8 = 664$ kw-hr. $1460/664 =$ **2.2 cents per kw-hr.**

82. 880 watts give .88 kw-hr. in an hour. $.88 \times 3412 =$ **3000 B.t.u. per hour.** $3000/4 = 750$ B.t.u. into 8 lbs. of water, or 94 B.t.u. per lb. Since one B.t.u. raises one lb. 1°, the rise of temperature $= 94°$. $60 + 94 =$ **154° F.**

83. Loss $= 30$ kw-hr. per hour $= 102{,}360$ B.t.u. One gallon raised 40° takes $8.3 \times 40 = 332$ B.t.u.; $102{,}360/332 =$ **308 gallons per hour.**

84. Since hp. $=$ pull $\times$ speed/550, pull $= 35 \times 550/3.5 = 5500$ lbs. Weight $= 5500/.70 = 7850$ lbs.

85. $450/5 = 90$ kw-hr. of energy supplied to motor. $90 \times .6 = 54$ kw-hr., output of motor; $54 \times 2{,}650{,}000 =$ **143,000,000 ft. lbs.** of work done.

86. 100 watt-hours or .1 kw-hr. $= .1 \times 3412 = 341$ B.t.u. As there are 384 cu. ft. of air, each gets $341/384 = .89$ B.t.u. Then $.89/.02 = 44.5°$ rise. $50° + 44.5° =$ **94.5°.**

Magnet Problems

87. A horseshoe-shaped electro-magnet has 350 turns on each leg. The average resistance per turn is .6 ohm. Find the total ampere turns on the magnet when the coils are connected in series on a 130-volt line. (Under these circumstances this magnet can lift 55 lbs., and the cores are practically saturated with magnetism.)

88. Find the ampere-turns on this magnet if its coils are connected in parallel on an 80-volt line. What can you tell about the lifting force under these circumstances?

89. Figure the power consumption and the B.t.u. developed per hour in Problems 87 and 88.

90. Calculate the cylindrical area of a stationary magnet coil 5.5 in. outside diameter and 7.8 in. long. What watt consumption is safe?

91. What voltage is safe to leave connected to this coil if its resistance is 30 ohms?

92. In a generator pole a certain flux is produced by 2.5 amperes flowing through 600 turns of wire. The pole is re-wound with 820 turns of wire having a resistance of 14 ohms. What voltage must be applied to give the former flux in the pole?

93. Find the ampere-turns of an electro-magnet to which a pressure of 120 volts is applied, sending a current of 3 amperes. Each turn of wire has an average resistance of 1/5 ohm. What is the watt consumption of this magnet? How many B.t.u. does it radiate in one hour?

94. A group of magnets in a generator heats a current of air from 80 to 95° Fahr. If all the heat produced is absorbed by this air and 800 cu. ft. are blown past per minute, what is the watt loss in the coils?

95. What is the external diameter of a magnet coil 7.4 in. long absorbing 160 watts, if the cylindrical surface radiates .8 watt per sq. in.?

96. A coil 1 ft. long is wound on a broomstick ¾ in. in diameter, then taken off and bent into a circle. Current sufficient to produce a total of 67 lines of force is sent through the coil. How many amperes flowed through its 150 turns?

97. A coil 30 in. long, of rectangular cross section 2.5 in x 4 in., is bent into a circle and 13 amperes sent through the 620 turns. What flux is produced? What would be the effect on the number of lines if one filled the turns of the coil with wood? with brass? with iron?

Mechanical Analogs—III.

BY G. R. SCHUCK

(Technical problems are frequently simplified by the use of an analogy. The following article, the last of a series, takes up the mechanical and electrical parallels in resistance, inductance and capacity in series. The author is on the electrical engineering staff of the University of Washington.—The Editor.)

RESISTANCE, INDUCTANCE AND CAPACITY IN SERIES

The three circuits which were shown in parallel in Fig. 3 are now connected in series as shown in Fig. 11, to the same source of alternating pressure. It is evident that the rate of flow of fluid through any part of this circuit must be the same, since the fluid is supposed to be incompressible. Therefore it is desirable to take the curve of fluid flow as a starting point in this analysis. Let I, Fig. 10, be the curve of fluid flow. The pressure at any instant between T and T^1 is divided between the three parts of the circuit, R, C and L. The problem is to determine the time relation between the pressures across L, R and C. It has previously been shown that the wave of pressure exactly coincided with the wave of fluid flow through the long pipe, because there is no absorbing or elastic medium as in C, nor retarding or inertia effect as in L. The fluid pressure consumed in R will therefore be directly proportional to the rate of flow at any instant and can be represented by the curve E_R, Fig. 10, coinciding in time relation with or in phase with curve I.

It is evident that the disc in L and the membrane in C must follow the oscillations of the flow of fluid and move backward and forward in unison. This fact will determine the time relation which the pressures across L and C have to the curve I, and to each other. Choosing the zero point on the curve

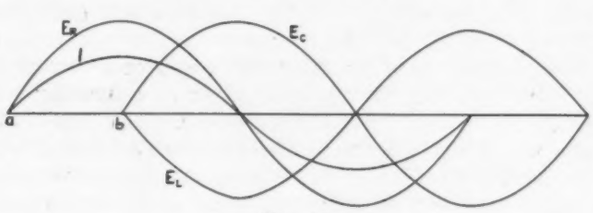


Fig. 10

Curves of pressure and flow in series circuits.

I, such as a, when the disc and the membrane are at one extreme range of oscillation, examine the direction and amount of pressure in L. It has been shown previously that when the disc was in the extreme position of motion, the pressure on the disc is a maximum, and just starting to force the disc in the reverse direction. Therefore the pressure in L is a maximum when the fluid flow is a minimum and may be represented by the curve E_L in Fig. 10 and the arrow in Fig. 9. Similarly it is easily shown that the pressure across C lags behind the flow of fluid by one-quarter of a period, and may be represented by the curve E_C, Fig. 10, and the arrow in Fig. 9. Now comparing E_L and E_C, it is found there is a difference in time relation, or phase relation, of two one-fourth periods, or one hundred and eighty degrees, showing that when the pressure in L is a maximum in one direction, the pressure in C is a maximum in the opposite direction.

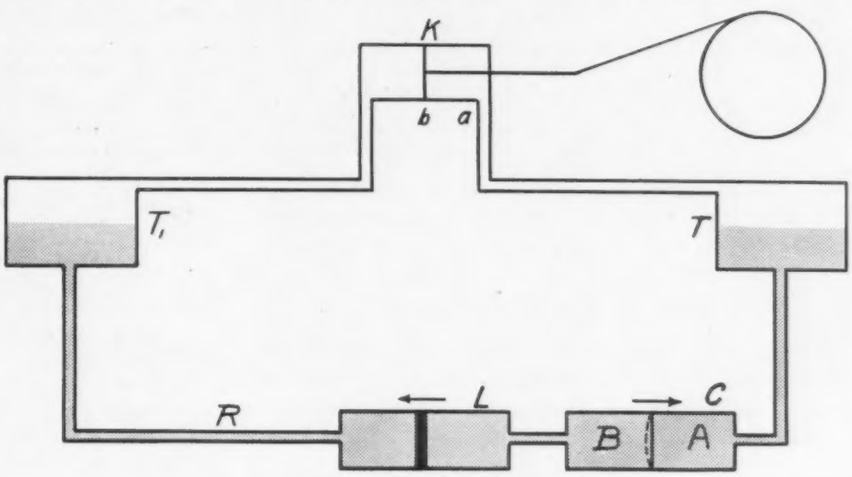


Fig. 9

Diagram illustrating mechanical cycle parallel to electrical cycle illustrated in Fig. 11.

If the elasticity of M and the inertia of D are made to be of proper value such that the opposing pressures are made equal, these two pressures will at all times balance, and their sum will be zero. Hence under these conditions the supply pressure is all used up in forcing the fluid through the pipe R, and the only thing which limits the flow of fluid is the frictional resistance in this pipe. If this resistance were removed or even greatly reduced, enormous oscillations of fluid would alternate through L, C and R, causing heavy forces to rise in L and C,

$50,000,000 is the estimate of the Los Angeles building permits for the year. The southwest metropolis is fast becoming an important industrial center.

HELP LOS ANGELES
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because of the momentum of D and the elasticity of M. These pressures might become greater than the supply pressure, and sufficient to rupture the membrane M.

The same phenomena which were observed in the foregoing system are also apparent in the system shown in Fig. 11, containing resistance, capacity and inductance in series. The same curve which represents fluid flow and pressure will also represent electric flow and electromotive force as far as time relation, or phase rotation is concerned. A voltmeter connected across either L^1 or C^1 might, under certain conditions, indicate more than the pressure mains, and be sufficient to break down the dielectric M. Values of L^1 and C^1 will be equal though opposite in direction; and a voltmeter across the two in series might indicate no voltage. Under these conditions the supply voltage is all used up in forcing current through the resistance. This condition in electric circuits is called "voltage resonance."

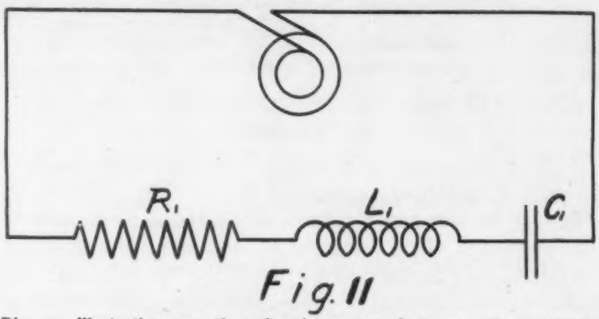


Fig. 11

Diagram illustrating operation of resistance, conductance and capacity in series on an electrical circuit.

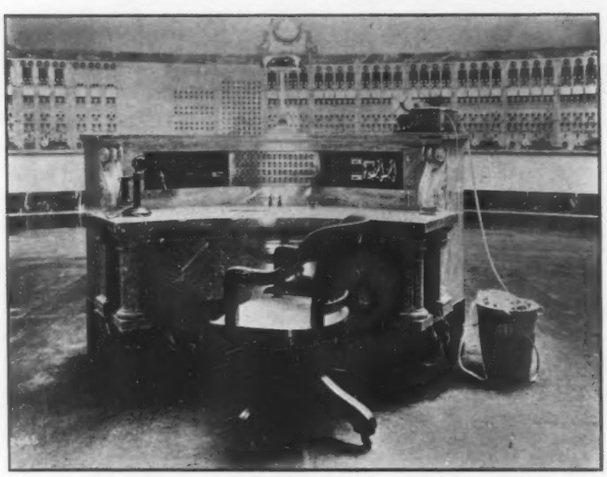
A Central Fire Alarm Station

BY C. W. GEIGER

(Nothing is more essential to a city's welfare than an efficient system of fire protection, and nothing is more fundamental to an efficient system of fire protection than a reliable fire-alarm central station. San Francisco can claim at present the most complete fire-alarm system ever installed in any city. The following article tells how electric current from storage batteries or from a gasoline-engine driven generator, as well as from power companies, can be used. The details of receiving and sending alarms are also given.—The Editor.)

One of the most important features of San Francisco's fire protection system is the central fire-alarm station in Jefferson Square. The entire fire-alarm system is undoubtedly the most complete and most thoroughly safeguarded that has ever been installed by any city.

The station is of concrete with steel frame, especially designed to withstand severe earthquake shock. It is fireproof, mothproof and burglarproof. In the construction of this station, every precaution possible was taken to protect the intricate electrical equipment from everything that might interfere with its efficient operation. Being located in the central part of Jefferson Park, it is almost entirely free from fire hazards from surrounding buildings, and from falling chimneys, etc. No buildings are permitted to be constructed within four hundred feet of the station.



Alarms are received on the signal circuits mounted on the main switchboard shown in the background. Alarms are sent out to the engine houses by an operator from the desk in the foreground.

Electrical Supply

There are three sources of supply for electric current, thus insuring the operation of the equipment under all conditions. These sources are: battery, the two public service companies (Pacific Gas & Electric Company and Great Western Power Company), and a gasoline-driven generator. In case the current from outside source is shut off, reliance is placed on the generator. The gasoline-engine is a 20-hp. Fairbanks-Morse type. It is located in the basement in a special room, and in order to eliminate any fire hazard from the engine, it is separated from the rest of the building by a 10-inch reinforced concrete wall.

Large storage capacity for fuel and water has been supplied which will enable this equipment to operate for a long period, without the necessity of obtaining additional supplies from outside. Duplicate storage batteries of 280 ampere-hour capacity supply current for operating the circuits on the main switchboard. In case the outside source of current is shut off, the battery is capable of operating all equipment for a period of 10 hours. In order that one set of batteries may always be held in reserve, two sets are provided. The batteries may always be held in reserve, two sets are provided. The batteries can be charged from the direct-current or the alternating current mains of the two different power companies.

The Operating Switchboard

The main operating switchboard is 102 feet in length, semi-circular in form, and is divided into three sections. There are now 48 working signal circuits, and a number of joker circuits. The station has an ultimate capacity of 80 signal circuits, sixteen

tapper circuits, sixteen alarm circuits, and sixteen joker circuits. The main operating switchboard comprises 41 panels, each panel being one inch thick, thirty inches wide and four and one-half feet in height, and constructed of Vermont Electric Blue marble. The semi-circular form of the main switchboard makes it self-sustaining.

Five panels on the main switchboard are devoted to "hospital" circuits. In case of trouble, such as open lines, grounded lines, and lines crossed up with outside circuits, they are switched on to the "hospital" circuits, which have better facilities for making tests than the regular operating circuits. Three tapper and three joker and six signal circuits can be handled at one time by the hospital circuits. Lines that may be in trouble are connected to the hospital circuits by means of plugs and jacks in a manner similar to that used by the ordinary telephone operator in making telephone connections.

At the present time there are 858 fire-alarm boxes, which are connected with the fire-alarm station by means of cables, carried in conduits of the telephone companies, the high-pressure piping system ducts and the ducts of the Department of Electricity. All cables terminate at manholes just outside the station, from which point they lead to a terminal rack, located in the basement, immediately under the main switchboard. From the terminal rack the wires are carried to the main switchboard, through three runways, one runway leading to each of the three sections of the switchboard.

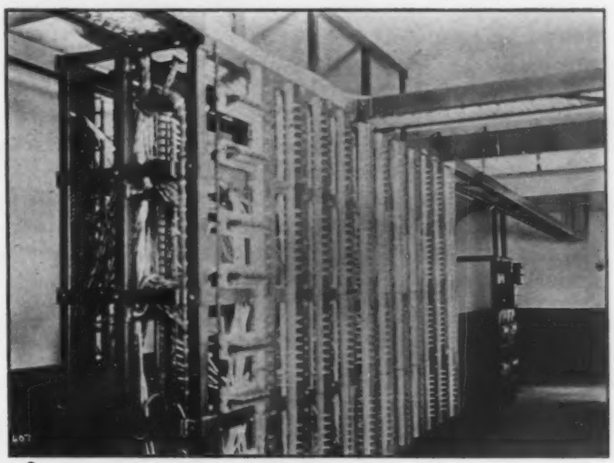
Receiving Alarms

All alarms from the street boxes are received at the central station on telegraph sounders and registers, no provision being made for the transmission of alarms directly from the fire-alarm boxes to engine houses. Each fire-alarm box is equipped with a clock mechanism and a character wheel. In turning in a fire alarm, all that is necessary is to pull down once on the hook. This releases the clock mechanism, and permits the character wheel to revolve four times before stopping. Each revolution of the character wheel sends in one alarm to the central station. Two men are required to operate the main switchboard, one operator being stationed at the main desk and the second at the registers, on the main switchboard. There are 48 incoming circuits for receiving alarms from the 848 fire-alarm boxes. Some of the incoming circuits carry as many as 40 fire-alarm boxes, while others only carry four, but the average number is 20 boxes to a circuit. At the present time an effort is being made to reduce the number of boxes to each circuit. The fire-alarm box number is shown on an illuminated box list (illuminated only when an alarm is being received), which is placed on the incoming circuit. A pilot light is placed immediately above this box list, which operates with the register, flashing the same code, calling attention of the operator in case he should fail to hear the sounder.

When an alarm from a fire-alarm box is being turned in, the operator at the desk calls out the number as he hears it, and at the same time the box number is checked on a list by the operator at the board. In order to verify the number, the operator at the board repeats the number as he hears it. If this tallies with the number as called by the man at the desk, the man at the desk immediately sends out the alarm to all the engine houses that are detailed to respond to that particular box number.

Clearing Traffic

If the operator at the desk finds that any of the fire engines will have to cross Market street, or make a run up or down Market street, he immediately throws a switch which operates the large warning bells on Market street. When these bells sound all traffic clears the streets, and all pedestrians remain on the sidewalks, and the traffic officers or policemen in the vicinity of the bells proceed to provide a right-of-way for the coming fire apparatus.



All cables terminate in manholes, first outside the station, from which point they lead to the terminal rack shown above. This is located in the basement immediately under the main switchboard. Two runways can be seen above the rack. Through these wires are carried to the main switchboard.

In order to guarantee that all fire apparatus has passed or crossed Market street, the bells sound for three minutes on all first alarms, and longer for second and third alarms.

Communication From Alarm Boxes

Each fire-alarm box is equipped with a regular telegraph service key and sounder. By means of this the battalion chief or his assistant can communicate with the operator at the central station. This renders very valuable service when the battalion chief desires additional engines, chemical wagons, or to increase the pressure at any hydrant connected with the high pressure system.

High Pressure Protection

The area in San Francisco that is protected by the high pressure system is divided into two zones: the lower zone, which includes those portions of the

$700,000,000 will be required in the next ten years to finance necessary construction work to meet the growing power requirements of the West.

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protected area less than one hundred and fifty feet in elevation, and the upper zone, which includes all those portions of the protected area, the elevation of which is more than one hundred and fifty feet.

Each of these zones is supplied with water under pressure up to about one hundred and fifty pounds from its own distributing reservoir. When necessary the mains of the upper zone may be connected with the Twin Peaks reservoir and the pressure raised to two hundred and eighty-four pounds or less, depending upon the elevation.

The mains of the lower zone may be connected with the reservoir of the upper zone or with the Twin Peaks reservoirs whenever pressures higher than ordinary are required.

It often happens that it becomes necessary to increase the pressure at a hydrant very quickly. The battalion chief signals the operator at the central station by means of the telegraph service key, and informs him that he wants a certain reservoir connected with the zone. The operator at the central station immediately telephones the operator at the particular reservoir, who opens the proper valves which increases the pressure at the hydrant. The entire operation often requires less than a minute. In ordering out additional engines, or chemical wagons, the operator at the central station sends out the proper signals on the joker lines.

Private Telephone Connections

The central fire-alarm station has private telephone connections with all fire-houses, pumping stations, reservoirs, and every department of the Fire Department. Connections with these departments are made through a telephone switchboard located in the building, and manned by an operator at all times. In the Olympic Club building fire-alarm bell and registers have been installed for the accommodation of fire department officials when using the bath and gym. An auxiliary fire-alarm box has been installed in the San Francisco Hospital to enable the attendants to turn in an alarm of fire without leaving the building.

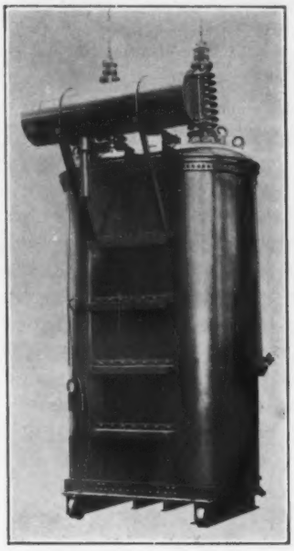
THE OIL CONSERVATOR

BY W. C. SMITH

(The latest development in oil immersed transformers, described here by a transformer sales engineer of the General Electric Company, is of especial interest to men of the West where this type of transformer is used extensively. Those who know the faults of the oil transformer will appreciate the announcement that the Oil Conservator eliminates "breathing," tends to avoid the possibility of explosion and to eliminate oil decomposition.—The Editor.)

In oil immersed transformers, the oil performs two functions, that of an insulating and of a cooling medium. To preserve these qualities it is necessary to maintain its dielectric strength and its ability to circulate freely. The Oil Conservator has been developed for preserving these qualities of transformer oil. It will also prevent deterioration of the solid insulation and will eliminate explosions due to the ignition of combustible gases which may collect above the oil in the ordinary transformer tank.

The oil conservator consists of an auxiliary tank mounted above the main tank and connected to its highest point by a suitable pipe. Under operating conditions the oil completely fills the main tank. The size of the auxiliary tank is governed by the expansion and contraction of the oil due to changes in temperature. At the lowest operating temperature, the oil must not contract so as to allow air to enter the main tank and at the maximum temperature the oil must not overflow the conservator.



The Oil Conservator which is a new form of tank for static transformers

The pipe between the two tanks is of such a section that oil expansion will take place without allowing free circulation of oil.

The presence of moisture in transformers has a most harmful effect, not only on the oil but on the solid insulation. Oil having a dielectric strength of 22 kv. between one-inch disks spaced 1/10 inch apart contains not more than eight parts of water in one million parts of oil. An additional 10½ parts of water, or a total of 18½ parts per million, will reduce the dielectric strength to 16½ kv., which is the lowest permissible limit for use in large or high voltage transformers.

Since the main tank is always full of oil under a slight pressure, air can not be drawn in through joints in the main tank which may not be tight, and the natural breathing due to the change in transformer temperature will affect the oil level in the auxiliary tank, where any condensation of moisture must take place. The condensation of moisture in the auxiliary tank is reduced to a minimum by the use of a breather or calcium chloride drying chamber, but should the breather be improperly cared for or even neglected entirely, the condensed moisture will fall to the bottom of the auxiliary tank where a sump is provided. The oil exchanged between the two tanks is taken from a point well above the sump and is practically free from moisture.

Preservation of Insulation —

Not only does the oil conservator preserve the insulating quality of the transformer by preventing moisture from entering the main tank, but it prolongs the life of the transformer by materially retarding the deterioration of the fibrous insulation such as cotton paper and fibre, which ordinarily takes place at the higher operating temperatures. As a specific illustration, accelerated life tests have shown that the deterioration of such insulations when operated at 105° C. with the oil conservator, is not greater than when the same insulations are operated without the oil conservator at 95° C. or less.

SPARKS—Current Facts, Figures and Fancy

(The last word in banking, theater lighting, fishing, navigation, hatching, and taxi bills appears on this page. Those who enjoy large scale pictures will be interested in plans for making one of the California coast, and the foreign trade and bigger business enthusiast will be delighted over the report of our Mexican trade and new buildings constructed last year.—The Editor.)

We are often inclined to grumble at the taxi bill, but then it helps to consider the prices in Petrograd where the fare for half an hour's ride in a taxicab is 2,000 roubles, which is the equivalent of nearly $1,000 in American money at normal exchange.

* * *

If you can't decide whether you like it wet or dry, go to a certain one of the Hawaiian islands where the rain falls at the swamping rate of one inch per day at one point and at the most conservative rate of twenty inches to the year at another.

* * *

A recent 4100-mile conversation is reported as having broken all records of long distance talking. Both wire and wireless telephones were combined to make possible a conversation between Avalon, California, and the steamer Gloucester, off Philadelphia.

* * *

The sea bank is the latest innovation of the financial world made possible since money can be transferred by wireless. An extra large safe has been made a part of the "Imperator's" equipment and drafts on shore banks are honored and the money transferred by radio.

* * *

California's nut crop is growing to enormous proportions. The 1920 walnut crop will total not less than 46,000,000 pounds, valued at from $10,000,000 to $31,000,000. But estimates do not stop there for shelled walnuts and by-products of walnut shells will bring the growers from $1,000,000 to $2,000,000 more.

* * *

It takes 17,637 lamps with a total of 451,010 watts to light the world's largest theater which has just been completed in New York. Interior illumination reaches its highest point of beauty here where canary, amber, blue, red and white lamps are all used in every conceivable way to produce the desired effects.

* * *

Switzerland never ceases to astound us with her progress in hydroelectric development. She now reports over 16,000 generating plants to a population of less than 4,000,000. In addition to power and lighting, electricity is now being used to a great extent for heating and cooking, in private houses as well as in institutions.

* * *

Plans are being laid for photographing the entire coast of the state of California by airplane. These plans are the result of the successful trip of three F-5-D navy seaplanes from San Francisco to San Diego in six hours and forty-five minutes. The ease with which this trip was taken proves that this type of plane can well be used for making a picture of the coast.

* * *

The electrically hatched chick will soon bring down the prices of eggs, according to a report from Portland which predicts a third of a million chickens per season as the output of the electrically-operated chicken farm known as "Henacres." This very year with a load of 36.5 kilowatts something like 100,000 chickens will be hatched.

* * *

Fish as well as forests are the favored subjects of airplane patrol. Fishing craft off the east coast of the United States are directed to the most promising schools by an accompanying plane which goes ahead with pilot, observer and radio operator. It is reported that record catches are being made under the modern fishing method.

* * *

High costs or no high costs, buildings must go up, as shown by statistics recently gathered for the year 1919. 377,000 buildings were erected during this year in the larger cities of the United States. The total cost of this construction is estimated at $1,300,000,000 which makes the 1919 record the highest yet reached in the building industries.

* * *

In spite of all disturbances the trade of the United States with Mexico is heading for the $300,000,000 line in the fiscal year 1920. On the import side, $40,000,000 worth of sisal, a substitute for hemp, heads the list and $26,000,000 worth of crude petroleum comes second. The biggest export items are $7,000,000 worth of iron pipe and $6,000,000 worth of cotton cloth.

* * *

No one has taught us a more valuable lesson than the rags-bottles-sacks man. He was the first to make a business of saving the waste. A small part of the result of this lesson is the sale, during the past ten years, of more than $14,000,000 worth of fuel briquets made from waste coal and waste petroleum residue. In fact briquets are becoming so popular that the Susquehanna river is to be dredged for refuse coal to be used in their manufacture.

154,000,000 acre-feet is the annual discharge of the Columbia River at the Dalles. This is only one of the water powers whose energy Portland hopes to utilize in its program of developing industry.

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PERSONALS

Admiral Joseph Lee Jayne, former commandant of the Twelfth Naval District and recently made commandant of the Pacific Train Fleet of the Pacific Fleet, has contributed inestimably to the development of the West in presenting feasible plans for and urging the construction of a causeway from Oakland to Goat Island for the purpose of making the latter a great bay terminal. A map presented elsewhere in this issue of the Journal of Electricity pictures the enormous industrial, financial and commercial center which will be made possible by the actual fulfilment of this project which has been the dream of the Bay region since 1869. After his graduation from the U. S. Naval Academy, Admiral Jayne studied at Johns Hopkins University where he received a certificate in applied electricity. During the Spanish-American war he was commander of the torpedo boat Rogers and since that time has been commander of various vessels including the U. S. S. New Jersey and Mississippi and Division Three, Battleship Force 1, of the Atlantic fleet. In September, 1918, he was made commander of the Twelfth Naval District, holding that position until his recent transfer to the supply division of the Pacific Fleet.

Douglas Drysdale, an electrical engineer of Scotland, is now in San Francisco.

George O. Muhlfield, vice-president and general manager of the Stone and Webster Company of Boston, Massachusetts, is a recent San Francisco visitor.

E. B. Bumsted, consulting electrical engineer of San Francisco, recently spent some time in Colorado with the Hermann Engineering Company, where he was engaged in the development of oil shale in the commonwealth of Colorado.

F. W. Brownell, general accountant of the Puget Sound Power & Light Company, Seattle, recently returned to his offices from Boise, Idaho, where he attended the Northwest Conference of Statistics and Accounts held in that city.

C. B. Hawley, general manager of the Inter-Mountain Electric Company of Salt Lake City, returned from a business trip to East Pittsburgh, Penn., during which he visited the factories of the Westinghouse Electric & Manufacturing Company.

J. W. S. Butler, formerly vice-president and general manager of the Western States Gas and Electric Company with headquarters at Stockton, California, is now Pacific Coast representative of Henry L. Doherty and Company and will have his headquarters in San Francisco.

P. H. Ducker, superintendent of transportation for the Southern California Edison Company, left Los Angeles on October 9 for a short trip to Eastern points for the purpose of studying traffic problems, particularly referring to the use of motor trucks. He will visit New York, Chicago, Boston, Philadelphia and Denver.

L. S. Ready, assistant chief engineer, California Railroad Commission, has been appointed a member of the executive committee of the San Francisco chapter of the American Institute of Electrical Engineers to take the place of W. G. Vincent, valuation engineer of the Pacific Gas & Electric Company, who has resigned.

Virginia Fairfax, librarian of the Carnation Milk Products Company, with headquarters in Chicago, and who has been contributing the interesting series of articles in indexing and filing that have appeared in the columns of the Journal of Electricity, will return this winter to California where she will give a course on the subject of filing of pamphlets and clippings at the Riverside Library School during January and February.

Herman Jansson, Lieutenant in Corps of the Swedish Royal Engineers, stopped in San Francisco during the past week as part of his visit to the West for the purpose of keeping in touch with the advancement of industry and the development of water power in this section of the United States. Mr. Jansson intends to return to Sweden via the Panama Canal. He is a member of the Swedish Royal Board of Waterfalls, Stockholm, Sweden.

O. B. Coldwell, vice-president of the Portland Railway, Light & Power Company, has been appointed a member of the Industrial Lighting Committee of the National Electric Light Association. This new committee of the Association was formed due to the great interest being taken at the present time in industrial lighting and it is the plan of the committee to take a lighting exhibit similar to the one that was shown at the last N. E. L. A. convention around the country.

Y. Furukawa, director and chief engineer of the Kyushu Electric Light and Traction Company, Fukuoaka, Japan, is making an extended visit throughout the West for the purpose of studying power company systems. Mr. Furukawa has already visited San Francisco and Salt Lake City, where he studied particularly the system of the Utah Power & Light Company. Seattle, Butte, Chicago and New York City are other points to be visited. Mr. Furukawa states that he intends purchasing some electrical machinery in New York.

L. P. Hockett, auditor and accountant with the Public Utilities Commission of Utah for the past two years, has resigned to accept a position with the Public Service Commission of the state of Washington. Mr. Hockett has been especially active in obtaining betterments in the accounting of public utilities before the state commissions. He was instrumental in bringing about a conference recently at Boise, attended by representatives of the accounting departments of the Washington, Oregon, Montana, Idaho and Utah commissions, at which a uniform system of accounting to be put into effect in the various states represented was taken up.

Roy C. Kenney, manager of the Portland office of NePage-McKenny and Company, was the host at the recent convention of the Oregon State Association of Electrical Contractors and Dealers, in his position as president of that organization. Mr. Kenney has held this office for two years and has just been re-elected for another term. Mr. Kenney started to work on the Pacific Coast in Seattle for the Agguter-Griswold Company and when that company went out of construction work in 1910 and began manufacturing he joined with the NePage-McKenny and Company which was formed at that time, and since then has represented the firm in Spokane, Seattle and Portland where he has been located for the past four years. Under the guidance of Mr. Kenney the contractor-dealers of Oregon have been very active in the promotion of the cooperative spirit among the different branches of the industry and in raising the standard of their own particular branch.

C. A. Semrad, general manager of the Western Light and Power Company of Colorado, was elected president of the Colorado Electric Power and Railway Association at their recent convention which was held in conjunction with the Rocky Mountain geographical division of the National Electric Light Association. Mr. Semrad graduated as an electrical engineer from the University of Wisconsin with the class of 1908 and for a time was instructor in hydraulics and water power at that university. He then entered the employ of the Union Light and Power Company of St. Louis for a year, leaving them to become a cadet engineer with the Northern Colorado Power Company, which position he held until 1914. The next four years were spent as general manager of the Cheyenne Light, Fuel and Power Company, a subsidiary of the Western Light and Power Company, and in 1918 Mr. Semrad was promoted to the position of general manager of the holding company. The election of Mr. Semrad as president of the Colorado Electric Light, Power and Railway Association assures the cooperation of this body with the newly formed Rocky Mountain division of the N. E. L. A. which should bring about long strides in the electrical industry in Colorado in the coming year.

F. R. Whittlesey, secretary of the Oregon Association of Electric Contractors and Dealers, is calling on the members throughout the state in the interests of the association.

W. R. Putnam, vice-president and general manager, Idaho Power Company, with headquarters at Boise, Idaho, has returned to his office from a four weeks trip in Eastern centers.

C. H. Delany, steam power plant specialist for the Pacific Gas & Electric Company, has been investigating and visiting a number of the larger steam power plants in Southern California.

Iwao Nesaka, chief electrical engineer of the Kyushu Hydroelectric Company of Kyushu, Japan, has recently made a tour of the Pacific Coast to investigate the systems and practices of long distance transmission.

C. M. Holliwell of Tolledo, Nebraska, is the new manager of the Windsor office of the Western Light & Power Company, Colorado. Mr. Holliwell is succeeding **W. R. Shade** who has been transferred to the office in Loveland, Colorado.

Major Houck, assistant supply sales manager, and **Judge Appleton,** chief counsel of the General Electric Company, in company with **T. E. Bibbins,** president of the Pacific States Electric Company, recently visited Portland while making a tour of the Pacific Coast.

J. I. Colwell, Seattle manager of the Western Electric Company, was in attendance at the recent convention of the Oregon Contractors and Dealers' Association where the subject of the Northwest Electric Service League was under discussion and so forcefully endorsed.

A. W. Leonard, president of the Puget Sound Power & Light Company, Seattle, left Seattle on October 17 for a week's trip covering the state of Washington with the Seattle Trade Relations Tour. There were approximately 125 Seattle business men, covering all interests, in the party.

L. H. Harvison, vice-president and sales manager of the M. W. Kellogg Company, is spending some time in the West, particularly in visiting industrial activities in and about the Bay of San Francisco. Mr. Harvison is interested in a process for cracking hydro-carbon components of crude petroleum in addition to the activities of the Kellogg Company.

M. C. Osborn, who is well known on the Pacific Coast, due to his long association with the Pacific Gas & Electric Company and the Washington Water Power Company, has been appointed Utilities' Representative of the Gillespie Eden Corporation with headquarters in New York.

R. C. W. Libbey is leaving on November 7 to attend the annual sales meeting of the Simplex Electric Heating Company at Cambridge, Mass., to return about the first of the year. He will stop en route at Los Angeles, Salt Lake City, Boise and Denver to attend to business for his company.

D. J. Young, vice-president of the Tacoma Gas Light and Fuel Company, has just completed a trip through California investigating operating conditions in the various power companies which have gas plants. Mr. Young was formerly connected with the San Diego Consolidated Gas and Electric Company.

Dr. Frederick E. Moll, commercial manager of the Bernese Light & Power Company of Berne, Switzerland, is a recent Pacific Coast visitor and is spending some time in investigating the hydroelectric situation in the West. Dr. Moll's company is one of the largest electrical power companies in Switzerland.

R. F. Sullivan, manager of the Tacoma Railway & Power Company, of the Stone & Webster interests, and **K. C. Schluss,** superintendent of power and equipment of the same company, attended the convention of the American Electric Railway Association held at Atlantic City from October 11 to 15. Before returning to Tacoma they visited the Boston offices of Stone & Webster.

Frank B. Rae, consulting engineer and one of the pioneers in electric development in the West, has returned to San Francisco where he will establish himself as a consulting electrical and mechanical engineer specializing on heating and ventilating problems. Mr. Rae was connected with the Western Union Company as electrician of the Pacific Coast division from 1877 to 1880 and had charge of the installation of the duplex and quadruplex overland circuits. From 1880 to 1883 he was connected with the Brush Electric Light Co. as electrical engineer in San Francisco and while with that company built the first plant of the San Jose Electric Light Co. and acted as general manager of that company. Mr. Rae then left for the East where he helped build the present form of ticker used in the New York Stock Exchange and did some pioneering in the field of electric railway construction. In 1888 Mr. Rae became engineer for the Detroit Electrical Works and built the Detroit street railway system which was known as the Rae system. Since that time he has had offices in Detroit, Chicago, New York and Cleveland as consulting engineer and he has now decided to come to the West where more electrical development is taking place than anywhere else in this country.

OBITUARY

William Waters, one of the best known figures in San Francisco contracting and building circles, died October 17. Mr. Waters was active in the rebuilding of many of the principal office buildings of San Francisco until 1913 when he was made Chief of Building Construction at the Panama-Pacific Exposition and Manager of Buildings during the Fair. In 1917 he had charge of the construction of Camp Fremont. For three years Mr. Waters had been a member of the engineering firm of Baker, Carpenter & Waters.

HAPPENINGS IN THE INDUSTRY

FUNDAMENTAL COST-ACCOUNTING STUDY PLANNED FOR NEXT YEAR

The Advisory Committee of the California Electrical Cooperative Campaign has adopted the plan of the Journal of Electricity and the extension division of the University of California of giving to the contractor-dealers a clear conception of just what cost-accounting is. It is the intention of the Journal of Electricity to publish a series of articles, beginning early next year, prepared by Prof. Henry R. Hatfield, dean of the college of commerce of the University of California and a prominent authority throughout the nation on accounting, covering the fundamentals of cost accounting and bookkeeping agreeable to the national system of standardized accounts adopted by the National Association of Contractors and Dealers some time back. Prof. Hatfield will be assisted in the research work necessary in this study by a graduate student of the university.

POWER APPLICATION FILED FOR UPPER KLAMATH LAKE IN OREGON

Roy W. Swicart, president of the Shasta Valley Irrigation Project, Montague, Cal., has filed with the state engineer of Oregon, an application covering the storage of 1,600,000 acre-feet of water in the Upper Klamath Lake for the irrigation of land and the development of power in California. A short time ago an application was filed by Mr. Swicart on behalf of the project covering the appropriation of 1500 second-feet of water in the Klamath River for irrigation and power development.

UTAH COMMISSION ORDERS SPECIAL POWER CONTRACTS TO BE MADE STANDARD

The Public Utilities Commission of Utah has just rendered a decision effective October 22 whereby all existing special power contracts of the Utah Power and Light Company customers in Utah are declared discriminatory and ordered placed on standard schedule. This is the result of a hearing in a special contract case which was held at the order of the Commission, and means an additional annual revenue to the power company of approximately $1,000,000. In all probability the power customers will appeal to the state Supreme Court and the case may possibly go to the United States Supreme Court.

DEVELOP ALASKA WATER POWER SITES TO RELEASE PAPER PULP SUPPLIES

From one-third to one-half the annual needs of the nation in paper pulp supplies would become available through the development of the large amounts of water power still untouched in Alaska, according to a report of the United States Forestry Bureau. Development of this water power would make 40,000,000,000 feet of paper pulp material available at the rate of approximately 1,200,000 tons per year.

In the timber area from which the paper pulp would come the following water power sites in Alaska have been investigated: Fish Creek, 10,000 hp., using water from three storage lakes; Swan Lake, 9,000 hp., with several storage lakes; Malia Bay, 5,000 hp.; Beaver Falls, 5,000 hp. with storage; Shrimp Bay, 7,000 hp., one storage lake; Bailey Bay, 6,000 hp., and several storage lakes; Mill Creek, 4,000 hp., and other nearby sites; Karta River, 4,000 hp., small lake; Hetta Inlet, 4,000 hp., with several small lakes at high altitudes; Thomas Bay, 28,000 hp., 15,000 hp. continuously; Sweetheart Falls, 15,000 hp. with large storage lake; Long Lake, 20,000 hp., and Crater Lake, 10,000 hp.; Treadwell, 12,000 hp., already developed; Mitchell Bay, 10,000 hp.; Warm Spring Bay and Cascade Bay, 5,000 hp. each; Silver Bay, 6,000 hp.

SAN JOAQUIN ISSUE OVERSUBSCRIBED THREE TIMES

The $2,625,000 of 8 per cent Convertible Trust Bonds of the San Joaquin Light and Power Corporation which were recently placed on the market in San Francisco were oversubscribed three times the first day. These bonds were Series D, dated November 1, 1935, are redeemable at 104 and interest, and were issued in denominations of $500 and $1,000. Their purpose is to refund the floating indebtedness accumulated in the construction of the Kerckhoff Power House and the additions to the Bakersfield steam plant. These two additions increase the generating capacity of the company 70,000 horsepower.

HEAVY OCTOBER SNOW FALL IN SIERRA MOUNTAINS

According to Weather Bureau statistics, more snow has fallen in the Sierra Mountains this month than in any October since 1878, with the exception of the year 1899. While 89 inches of snow fell at Summit, California, twenty-one years ago, forty-one inches has fallen in the first two-thirds of the month of October, 1920. The mean snow fall for October is given as 13.6 inches.

As early season snow is of much more value than snow which falls late in the season, there is every reason for power companies throughout the coast states to be optimistic on their supply of water for next year. Rain fall in good volume is reported generally among the coast states in October, and supplies of water for power purposes have increased to the extent that former power is in most instances available.

IDAHO COMMISSION RULES ON HEATING

Public Utilities Commission of Idaho has granted authority to the Idaho Power Company, Boise, Idaho, to make its schedule No. 14-A of rates for air and water heating effective for all customers, dated October 1. This is equivalent to granting a 30 per cent increase in rates for this class of service throughout its entire territory. Permission was also given the company to refuse to new customers more than 4-kw. connected load for air or water heating.

The commission concluded that the use of electricity for heating air and water for domestic purposes is not feasible. This finding, together with the fact established by the company that the equipment necessary for heating service is needed for power uses, and cannot be confined to heating service without operating at a loss, governed the commission in granting the increased rates.

POWER RESTRICTION LIFTED IN CALIFORNIA

Recent rains have made possible the lifting of the ban on the use of power in the northern and central parts of California. Power Administrator H. G. Butler on October 11 removed all restrictions against the use of power except the restriction on skip-stop and that restriction was lifted on October 18. According to the Commission, there will be no return to the restrictions unless there is a dry fall, in which event the power companies and the public will again be placed

on a limited allowance of electricity. Not since last June, when the need for power conservation became apparent, have the power companies been free from strict regulation. The situation in the state from a power standpoint is considered satisfactory and the Commissioner advised that there is no longer any need for curtailing the use of electricity.

LOS ANGELES CITY RATES INCREASED

With the adoption by the City Council of Los Angeles of ordinance No. 40890, all rates for electric service in the city were increased 12½ per cent, effective October 11. This followed a long discussion and will tend to relieve the situation brought about by increased operating costs, and which affected companies operating in the city. The former maximum lighting rate of 5.5 cents becomes 6.2 cents and the maximum power rate is increased from 4.5 to 5.1 cents, all other rates being increased in the same proportion. Consumers of the Los Angeles Gas and Electric Corporation, the Southern California Edison Company and the City Bureau of Power and Light are affected.

EXTRACTS FROM PUBLIC UTILITY COMMISSION CASES IN 1920

A summary of many of the most striking statements by utility commissions in deciding cases granting relief to public utilities of some of the Western states during the present year has been sent out by the Publicity Committee of the N. E. L. A., with the belief that the points considered will be of benefit to many companies now considering the matter of rate increase. Of the seventeen state commissions throughout the country which have granted relief to public utilities to date this year, the following are quotations from some of these cases which affect utilities in the West:

IDAHO POWER COMPANY, June 2: "Obtaining money for a further investment when that already made is not yielding a compensatory return is difficult and the time when the preparations must be made for the new demand is now." Increase.

SOUTHERN CALIFORNIA EDISON COMPANY, April 15: "It is vitally necessary for the continued growth and prosperity of the vast territory in Southern California supplied by this company with electric energy that its full program of electric development go forward without serious interruption. We believe it to be in the interests of the consumers that they pay rates sufficiently reasonable to enable the company to earn a fair and reasonable return upon the actual investment. Unless this is done it is plain that the utility cannot borrow sufficient funds to carry forward necessary development." Increase of 27 per cent.

MISSION RANGE POWER COMPANY, February 20: "Despite abundant power, no one else seems willing to undertake the hazard of developing it, and those who have made the risk are entitled as a minimum to a fair return upon their investment." Increase.

ARIZONA, telephones, rates and charges: "We do not believe that it was intended that the regulatory powers vested in this commission should be used to the disadvantage or inequity of the public utilities of the state, and we believe we can render a greater service to the citizenship by giving rates which, while they are just and reasonable to the public, will enable the company to maintain a standard of service fully equal to public necessities and provide for extensions of service which will encourage rather than retard the growth and development of the state." Increase.

OREGON COMPANY FILES FIRST COMPLETE WATER POWER APPLICATION

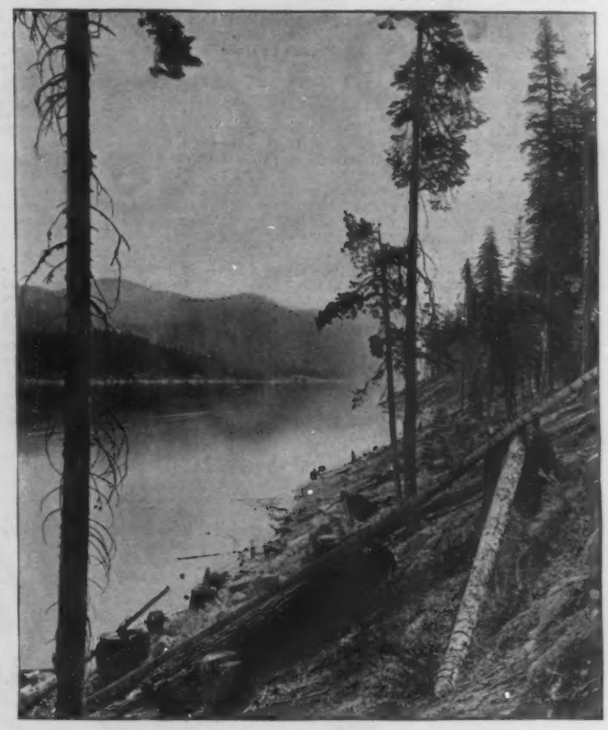
The Columbia Valley Power Company, which plans project work on the Deschutes River in Oregon, is the first company to make an application absolutely completed and perfected so as to conform with the regulations issued by the Federal Power Commission. This application was among the latest received but was applied for in person by C. D. Charles of Denver who had all the necessary data in his possession to enable him to make out a complete application. In this he was assisted by Col. William Kelly, the engineer officer of the Commission. Certain information is still lacking in each of the other applications which have been filed as these Federal regulations were issued after the applications were made out. It is expected, however, that the preliminary permit for the Washington Irrigation and Development Company for its project on the Priest Rapids of the Columbia River, Washington, will be completed very soon.

NEWSPAPER MEN VISIT BIG CREEK PROJECT OF SOUTHERN CALIFORNIA EDISON COMPANY

(On the hearty cooperation of the press much of the success of the great power program of the West depends. One of the first important steps towards securing this cooperation was recently taken by the Southern California Edison Company as described below.—The Editor.)

Practically every newspaper in southern and central California was represented in a party of inspection sponsored by the Southern California Edison Company in connection with its two hundred million dollar construction program in the Big Creek region.

The party left Los Angeles Friday evening, October 8, by special train, arriving in Fresno Saturday morning where



Huntington Lake Reservoir at an elevation of 7000 feet, and with a storage capacity of 88,400 acre feet, supplies Big Creek Power House Nos. 1 and 2, each with an installed capacity of 32,000 kw.

San Joaquin Valley editors joined the excursion. From Fresno the special was run to El Prado where the passengers transferred to the San Joaquin and Eastern Railway for Cascada.

Three days were spent in going over the Edison properties with Huntington Lake Lodge as headquarters. The editors, seventy in number, were unanimous in the opinion that the future expansion and prosperity of the state are very closely allied with the power program. For the first time, these men had the opportunity of studying the problems of hydroelectric development. Tunnels, dams, power-houses and transmission lines acquired a new meaning. They went over

5,500 different industries are located in the San Francisco-Oakland district. The development of a great industrial center in the San Francisco Bay region is the plan of the next few years.

HELP SAN FRANCISCO-OAKLAND PUT IT OVER

the ground and followed the watercourses which will yield 750,000 hp. when the fifteen-year program is finished.

Two evening meetings were held. At the first, company officials explained in detail the future plans for power which call for the completion of new plants at the rate of 50,000 hp. annually for the next fifteen years. The need for local support in a financial way was demonstrated and the importance of rates sufficient to maintain a sound financial statement which will encourage further investment of Eastern capital was made clear. At the second meeting the Pasadena Convention film "That Fairy in the Snowflake" was presented, followed by an open forum.

As a result of the trip the press of California will have a clearer conception of the power resources of the state and the necessity of their complete utilization. The members of the party were as follows:

F. W. Tenney, San Pedro News; C. F. Waits, San Pedro Daily Pilot; E. C. Wickhizer, South Pasadena Record and Courier; C. H. Connor, Star-News, Pasadena; E. S. Kellogg, Pasadena Evening Post; A. T. Richardson, Pomona Daily Progress; R. L. Driscoll, Pomona Daily Bulletin; Crombie Allen, Ontario Daily Bulletin; E. L. Howell, Chino Champion; J. P. Baumgartner, Santa Ana Register; M. A. Yarnell, Santa Ana Bulletin; W. O. Hart, Orange News; W. L. Taylor, Orange Star; Paul Hester, Anaheim Plaindealer; W. L. Rideout, Placentia Courier; J. J. Conrad, Huntington Beach News; Everett J. Horsely, Anaheim Herald; Paul Moore, Redlands Facts; Frank Arthur, Redlands Facts; C. B. Irvine, Culver City Call; Walter W. Rennie, Vanguard News; S. E. DeRankin, Santa Monica Outlook; George Orgibet, Redondo Breeze; C. H. Turner, Redondo Reflex; F. A. Johnson, Hermosa Beach Review; J. V. Van Eaton, El Segundo Herald; G. F. Reinhart, Covina Citizen; E. V. Jensen, Azusa Pomotropic; C. O. Broyon, Monrovia Messenger; Azusa Pomotropic and Arcadia Journal; R. B. Kennedy, Whittier News; Ed. Van Matre, Downey Champion; A. V. Douglas, Brea and La Habra Star; Cecil Wilcox, Lankershim Laconic; Frank Keffer, Van Nuys News; R. C. Harbison, San Bernardino Sun; C. A. Welsher, Suburban Home, Watts; W. L. Lefavor, Watts Advertiser; Wm. G. Gilstrap, San Gabriel Sun; Wendell P. Chambers, Alhambra Federated News; Archie J. Hicks, Palmdale Post; J. J. Krouser, Oxnard Courier; C. F. Hoffman, Moorpark Enterprise; Tobias Larson, Fillmore Herald; W. E. Wagener, Fillmore Herald; T. C. Holt, Santa Barbara News; A. A. Smith, Visalia Daily Times; W. S. Clawson, Exeter Sun; John G. Ropes, Woodlake Echo; Larry Smith, Hanford Journal; J. Mitchell, Hanford Sentinel; John A. Rollins, Tulare Daily Advance; H. A. Charters, Tulare Daily Register; F. C. Rhodes, McFarland Weekly; Mrs. F. C. Rhodes, McFarland Weekly; W. A. Hawley, First National Bank, Delano; Earl R. Clemons, Terra Bella News; John R. Bell, Porterville Recorder; J. R. Gould, Strathmore Sentinel; A. L. Evans, Lindsay Gazette; Wesley Barr, Los Angeles Herald; Alexander Tulley, Los Angeles Express; E. K. Hoak, Los Angeles Financial News; Burton Knisely, Los Angeles Record; Denton Crow, Los Angeles Associated Press; O. T. Palmer, Hollywood Citizen; John King, Pres. Pub. Ass'n, Hemet; Edward Fairchilds, Los Angeles Examiner.

"SAY MERRY CHRISTMAS ELECTRICALLY"

"Say Merry Christmas Electrically" is the idea which the Society for Electrical Development intends to sell to the holiday shopper through the big drive they are now starting.

The feature of the campaign material to be issued this year will be the five-piece window display cut-out. This set will be lithographed in eight colors. It will be of such a nature that it will be appropriate in any size or shape of window. With the cut-outs will be included full illustrated instructions for making the most instructive use of the material.

An illustration which shows a suggested method of using the window display cut-out which the Society for Electrical Development is issuing for the use of the electrical dealer.

An innovation will be attractively hand-lettered invitations for merchants to mail to prospective customers urging them to visit their shop and see the display of electrical Christmas gifts. These will be printed in two colors on folded sheets of note paper, envelopes to match being supplied.

There will also be folders and booklets describing and illustrating many different electrical gifts, lantern slides and popular poster stamps. The poster stamps will carry the design used on the central panel of the window display cut-outs.

In the Holiday Campaign issue of the Sales Service Monthly there will be from 15 to 20 newspaper advertisements. Every ad suggestion is illustrated and cuts or mats of the illustrations will be supplied by the Society upon request.

The Society states that any electrical merchants believing that it will not be necessary to make a particular effort are doomed to disappointment. There is business to be had—but it must be sought. Merchants in other lines are realizing this and will make unusual efforts to secure their share of the holiday trade.

MORE PREFERRED STOCK TO BE ISSUED BY P. G. & E.

Pacific Gas & Electric Company is offering its first preferred stock, to yield 7½ per cent on the investment. This is in line with a recent order of the California Railroad Commission authorizing an issue of $1,000,000, proceeds to be applied to part payment of construction expenses. Authority has been asked to issue $5,000,000 of this stock.

SAN JOAQUIN LIGHT & POWER APPLIES FOR PERMIT ON BEAR CREEK

Application has been made by the San Joaquin Light & Power Corporation to use a hundred second-feet of water from Bear Creek. According to the plans the company intends to spend $1,200,000 on the construction of a dam 1600 ft. long which will store 21,000 acre-feet of water and develop 8,400 hp.

WESTINGHOUSE AND SIMPLEX HEATERS NOT INFRINGEMENTS ON MAJESTIC'S PATENT

The cases for infringement of patent of the Majestic Electric Development Company, San Francisco, Cal., against the Westinghouse Electric & Manufacturing Company and Holbrook, Merrill & Stetson, agents for the Simplex Heating Company, were recently tried in San Francisco with the result that while the court did not hold that the Majestic patents were invalid, it was held that the Westinghouse and Simplex heaters were not infringements. The Majestic company advises that it will immediately appeal to the United States Circuit of Appeals this decision of the United States District Court at San Francisco. The Majestic company also advises that suits will shortly be brought against other companies in defense of the same and other patents.

OREGON INDUSTRIAL COURT IS PROPOSED

Settlement of all industrial disputes and regulation of industries by three judges to be appointed by the governor is the purpose of a bill which will be presented for consideration at the next session of the legislature. The judges, according to the proposed measure, will constitute a court of

industrial relations, and the appointment of the personnel must be made with the advice and consent of the senate.

Although the proposed bill will be copied to some extent from the industrial court law enacted in Kansas, that feature of the measure providing for the abolishment of the public service commission will probably not be followed. It is likely, however, that if enacted the bill will merge the affairs of the present public service commission with the tribunal of industrial relations to avoid any duplication of effort.

ADVERTISING OF HYDRO PROJECTS PRIOR TO COMPLETION OF APPLICATION PERMITTED

The Federal Power Commission has authorized the advertising of the applications for licenses under the Water Power Act of the Crown-Willamette Paper Company of Oregon and the Pit River Power Company of California prior to the completion of their respective applications. Construction is already under way in the latter case and in the former case, because of the serious shortage of paper in California, the rule was departed from in order that preliminary construction on a pulp and paper project might begin at an early date.

CONTRACTOR-DEALER BUSINESS IN SAN FRANCISCO IN 1919

Results of a questionnaire recently sent out to contractor-dealers in San Francisco show some estimated financial figures for the year 1919. Although all contractor-dealers did not respond, returns were received from twenty-six generally known to be responsible for most of the work placed in the city. Capital invested, $769,208; gross business, $2,111,113; payroll, $583,498; material purchased, including supplies and stock, $1,735,530.

PASADENA TO INVESTIGATE HYDROELECTRIC PROJECT

Authorization has been given by the City Commission of Pasadena, Cal., to T. W. Koyner, general manager of the Municipal Lighting Department, and Samuel B. Morris, chief engineer of the Municipal Water Department, to investigate a project near that city which it is expected will bring from 15,000 to 25,000 hp. in hydroelectric energy.

RECORD OIL PRODUCTION IN CALIFORNIA IN SEPTEMBER

The September production of all oil companies in California of 304,340 barrels a day established a record figure for the state, according to a statement of the Standard Oil Company in California. Daily production of 302,400 barrels in June, 1914, was the highest previous figure recorded. New production in the Elks Mills, it is said, was mainly responsible for the large figure. While fifty-five new wells were completed in September, with an initial daily production of 21,775 barrels, stocks decreased by over 275,000 barrels in the month.

SAN DIEGO APPLIES TO ISSUE SECURITIES

The San Diego (Cal.) Consolidated Gas and Electric Company on October 20 applied to the Railroad Commission for authority to issue $500,000 of its first mortgage five per cent gold bonds and $604,000 of its preferred stock. Both issues are to go to the San Diego Electric Railway Company and the United Light, Fuel and Power Company in payment for the power plant of the railway company and the steam heat distributing system of the United. Both of these corporations have applied to the Railroad Commission for authority to sell their plants to the San Diego Consolidated Gas and Electric Company.

SOUTHERN SIERRAS AND HOLTON COMPANIES GRANTED RATE INCREASES

On Sept. 17, the Railroad Commission of California authorized the Southern Sierras Power Company and the Holton Power Company to increase their rates for electric energy in an amount which will provide a return estimated at 8.4 per cent. The added cost to the consumers of the former company will approximate 19.2 per cent, while that to the Holton consumers will be about 10.4 per cent. Both companies being jointly owned, the increase to the public on the combined systems will approximate 16.5 per cent. The new rates for lighting and cooking became effective on Southern Sierra Power Company's meter readings of Sept. 20, while the power rates will be effective Nov. 1. Meanwhile a 20 per cent surcharge is to be collected. In the case of the Holton Company, new lighting and cooking schedules are effective Sept. 20 and power schedules on Oct. 31, with a 15 per cent surcharge collected in the meantime.

The Sierras Power Company is directed by the Commission to charge the Nevada-California Power Company one cent per kw-hr. for all energy delivered for resale to the Nevada customers of the utility. The Nevada company owns four of the plants (and transmission lines) operated by the Sierras company, and their rental is fixed by the Commission at $500,000, as against charges under a leasing arrangement totaling $596,732. Immediate installation of a meter to measure power sold to the parent company is ordered by the Commission.

In discussing service in the Imperial Valley, referring to the two steam stand-by plants of the Holton company and the conditions that make continuous steam operation there uneconomical, the Commission holds that large consumers requiring continuous service must install their own stand-by until the growth of load justifies an investment sufficient to install sufficient capacity.

"However," says the Commission,

"the service in the valley is continually growing and it is apparent that definite steps should be taken at this time toward bettering the quality of service being rendered even if this requires considerable investment on the part of the utilities. Either a standby plant sufficient to carry the essential loads, which can be put in operation at a shorter notice than the present plants, should be planned or an additional source of power should be arranged for. The companies owe an obligation to their consumers in the Imperial Valley to take steps to this end and it will be expected of them that they present to the Commission not later than January 1, 1921, a practical plan of improving the service."

Regarding the rule of the companies, approved by the Commission, covering the financial demands of the companies in connection with service extensions, the Commission says:

"It does not appear that a modification of the rule is justified at the present time due to financial difficulties existing, with the exception that, pending final decision of the Commission, Holton Power Company and Southern Sierras Power Company should make all extensions without charge to applicant for lighting service where the cost of the same does not exceed $80 per consumer."

"Under the circumstances," it is added,

"it is reasonable for the companies to call upon applicants desiring service to assist them by the advance of moneys, it being understood, of course, that where the entire cost of an extension is advanced the company will pay interest thereon in cases where the company will make the extension without advance were money available. The demands for power developments to meet the growth of business on the company's system is taxing them to the full extent of their ability to cover the cost of power plant construction and general transmission and distribution additions."

"A logical districting of the company as regards rates for lighting service," says the Commission, "would be to

$150,000,000 in crops can be raised annually on the arid lands which will be irrigated by the Colorado River Project and over one million people can be supported on this territory—later to become electrical customers.

HELP THE LEAGUE OF THE SOUTHWEST TO PUT IT OVER

divide the system of Southern Sierras Power Company into five districts, as follows:

"(1) The territory north of San Bernardino mountains.
"(2) The territory south of the San Bernardino mountains, excluding Coachella Valley and the city of San Bernardino.
"(3) Coachella Valley.
"(4, City of San Bernardino.
"(5) City of Blythe."

The Commission, in declining to exempt Coachella Valley from the increase and in answer to the claim of the Coachella Valley consumers that they can not afford to pay more for power, suggests that the Sierras company waive existing contractural rights in the event that individual consumers find it more economical to use other forms of power.

The new rates, according to the Commission, are fixed on a valuation of $7,618,541 for the Southern Sierras Company and $1,111,500 for the Holton Company, or a total valuation of $8,730,091 for both. The Commission estimates that the gross operating revenue of the Sierras company for 1920 will total $1,696,020; Holton company $618,550. Combined revenue, $2,314,570. Combined gross operating expense, $1,644,480 divided as follows: Sierras company $1,141,410; Holton company $503,070.

COAST VALLEYS ELECTRIC REQUESTS BOND ISSUE

The Coast Valleys Gas & Electric Company, San Francisco, Cal., on October 14 applied to the California Railroad Commission for authority to issue $375,000 of its first mortgage, 6 per cent, forty year gold bonds. According to the application, the proceeds are to be used to reimburse its treasury for money spent out of earnings for improvements and betterments and to provide funds for planned improvements to the company's system throughout Monterey county. The company estimates that it will require approximately $84,000 to complete work already under way and that improvements planned but not yet started will call for an expenditure of $323,580.

Among the planned electrical improvements are: Increased capacity of 4000-volt feeders in Salinas Valley, $20,000; distribution line extensions next twelve months, $12,000; new outdoor high-tension substation at Salinas, $15,000; new distribution substations east and west sides of Salinas Valley, $30,000; duplicate transmission line from Metz to King City, $25,000; convert Soledad-King City line from 30 kv. to 60 kv., $30,600; total, $132,600.

TRADE NOTES

Combination For Insulator Research —

An arrangement has been made whereby the General Electric Company has acquired an interest in the Locke Insulator Corporation. The officers and directors of the corporation are:

Donald Symington, president; John F. Symington, vice-president; F. H. Reagan, vice-president; W. G. Hoffman, Jr., treasurer, and J. F. Douty, secretary. The directors, in addition to the president and two vice-presidents, are G. E. Emmons, C. W. Appleton, D. R. Bullen, J. W. Upp, George P. Baldwin, C. J. Symington and Walter T. Goddard.

This arrangement will result in engineering and research cooperation between the two companies with respect to insulator problems. The manufacturing facilities of the Locke Company will be greatly increased upon the completion of its new plant at Baltimore early next year.

Western Electric's High Volume of Business —

Sales of the Western Electric Company are running at a higher rate than at any other period in its history, according to a recent report from the company. For eight months of the current year its domestic billing showed a total volume of $119,500,000.00, indicating domestic sales for the year approximately $190,000,000.00. This does not include export business nor sales of its foreign affiliated companies.

Pacific Coast Office Established —

The Manistee Iron Works Company of Manistee, Michigan, have established a Pacific Coast District Office in the Rialto Building, San Francisco. The district will be in charge of Mr. L. M. Page, general sales manager for the past five years. Branch offices will shortly be opened at Los Angeles, Portland and Seattle.

Retrospect of Fan-Motor Season —

An optimistic view of the fan-motor situation is contained in a statement just issued by the Fan Motor Section of the Associated Manufacturers of Electrical Supplies. It is stated that the left-over stocks in the South are very low, in the West quite small, in the Southwest below normal, on the Pacific Coast law, while in the East the stock is a bit larger than usual, due in a measure to unfavorable weather conditions having set in which tended to prevent the jobber and dealer from disposing of stocks. However, a line drawn between the East and West would show a normal left-over stock of fans.

It is thought that this left-over stock will not have any appreciable effect on the trade next year and manufacturers are very optimistic about the future fan-motor business, particularly regarding its use in the home. Efforts are to be made to emphasize to the trade through various mediums the uses of the fan in winter so as to make it an all-the-year-round utility device instead of a seasonable luxury, as it has been regarded by many. Most of the manufacturers are planning for an increased production of from 20 to 25 per cent and one in particular is planning for a 40 per cent increase. Some of the smaller manufacturers, while not planning for an increased production, are keeping up to the 1920 schedule.

Certain difficulties are being experienced in securing raw materials, particularly foundry products. Wire is now easier. The situation is by no means normal yet, as the manufacturers see it. Work on the production of fans is carried on throughout the year and manufacturing orders for 1921 stock were placed last winter. It is hardly believed that there will be any recession in prices this year, in fact, there will probably be some increases. There have been no decreases in the price of labor or raw materials and much raw material was purchased last winter when the prices were at top notch. It is felt that jobbers can be of great assistance in aiding manufacturers to move stock by placing orders for fans earlier in the year than they have been accustomed to doing, and in this connection manufacturers expect to issue their price schedules earlier this fall than they usually do. A big demand is expected for 8, 10 and 12-inch sizes, while ceiling fans have just experienced a phenomenal run and are expected to run high next year.

Sales Agent Moves West —

H. Alex Hibbard, who has for the past three years been general sales agent for the T & W Universal Plug Co. with offices at Chicago, has resigned his position and will return to Denver to look after the interests of Alex Hibbard, Inc., electrical sales engineers, of which company he is president.

New Store in Long Beach —

The J. W. Lane Electric Company formally opened their new store and showroom in Long Beach a short time ago. This company's new home, which is located at 201-205 East Third Street, is modern in every respect and follows the recommendations of the California Cooperative Campaign in its arrangements, although Mr. Lane has introduced many novel and distinctive features. The following comment, made by Mr. Lane to a local reporter, is interesting:

"Distinction in the shop, in its equipment, its service, display, and its general appeal to the public is the ideal. In operating I shall attempt to supply everything the public demands. I have learned the value of this through seeing one man grow from an unimportant person to the biggest merchant in a large middle western city by this policy."

Meeting Notices for Electrical Men

(A review of the many accomplishments of the California Cooperative Campaign and a summary of the comprehensive plans for the future are included in the report of the Advisory Committee of the Campaign which appears on this page. A landmark among engineering activities in the West is the announcement of the 1921 A. I. E. E. Salt Lake Convention which appears here along with news of a Pacific Coast Radio Convention.—The Editor.)

California Cooperative Campaign Advisory Committee Makes Report

The Advisory Committee of the California Electrical Cooperative Campaign met during August and planned an extensive advertising campaign for the Christmas holiday season. It was decided to assume direct charge of all the electrical home exhibits in the future, instead of leaving this in the hands of local groups in each city. Preparatory plans were made for the organization of a speakers' bureau to tell the electrical story, and especially the hydroelectric development story, to all commercial, civic and women's clubs in California. This work the Advisory Committee intends doing in collaboration with the Publicity Committee of the Pacific Coast Section of the N. E. L. A.

In the committee's report on electrical homes, it is shown that results have already been reported in the electrical industry which are especially gratifying to the Campaign. Already realty men are building new homes which follow quite closely the plans of the electrical homes, and architects and contractors have been working with the construction engineer of the Campaign and report increased enthusiasm on the part of house owners and prospective builders for a higher grade of wiring and for more outlets. In Oakland it is reported that every builder has increased the number of his outlets 50 per cent and in Los Angeles electrical contractors report a 20 per cent increase in number of convenience outlets being provided. If the Campaign has done nothing more, it has awakened the people and those interested in building to the actual necessity of more outlets than appear in the ordinary lighting fixture and the effort is already beginning to bear fruit .

It has not been the intention of the Campaign in these model homes to install the last word in wiring. It has been their aim, however, to put in the best wiring job that can be commercialized. The wiring in the San Francisco, Sacramento and Oakland homes cost $700, $250, and $500 respectively.

It is of interest to note the number of persons who visited these homes in the periods of two weeks in which they were open. In round numbers 20,000 persons visited the San Francisco home, 10,000 at Sacramento and 30,000 at Oakland. Of a special value to contractors and retailers is the list of live prospects which was obtained from the Oakland home, where approximately 10,000 names were registered on cards provided for that purpose. In San Francisco about 8,000 persons registered.

The quality of the crowds attracted by the electrical homes has been very high. Practically all visitors are people who own or are intending to build or buy homes. Another interesting angle of the electrical home is that every real estate firm which has had an electrical home has already made request that others be held on their property. Other real estate companies have requested the opening of homes in their districts.

Arrangements are being made to open homes in Los Angeles, Long Beach, San Diego and Fresno before the end of this year. Of the two homes projected in Los Angeles, one is being built of adobe at an expense of about $40,000, and is said to be the first two-story adobe house to be built in Los Angeles within the last fifty years.

In the matter of publicity, the Campaign is preparing a series of ten illustrated lectures on the electrical home, room by room, which will run in fifteen of the largest newspapers in California from the first of November until the first of January. With these stories the Campaign not only hopes more thoroughly to sell the electrical home idea, but also to increase the demand for electrical appliances during the Christmas season.

BUILDERS OF THE WEST—LXXXVIII

RAPHAEL WEILL

The enterprise and enthusiasm which have characterized the engineering progress of the West have their counterpart in the field of retail merchandising where they have made possible the rapid upbuilding of outstanding commercial enterprises. It is this same spirit which has resulted in such institutions as the California Electrical Cooperative Campaign, widely recognized today as one of the most distinctive achievements of the electrical industry in the West. To Raphael Weill, vice-president of the White House Company, San Francisco pioneer in merchandising, this issue of the Journal of Electricity is affectionately dedicated in appreciation of his contribution to the West in establishing and maintaining those high standards in commercial life which have become so fundamental a part of the Western vision of today.

Salt Lake City Gets 1921 A. I. E. E. Convention

At a meeting of the Board of Directors of the A. I. E. E., held in Philadelphia October 8, it was decided to hold the 1921 Annual Convention jointly with the Pacific Coast Convention at Salt Lake City, Utah, during the week beginning Monday, June 20th.

The principal argument in favor of combining the two conventions, as advanced by the Pacific Coast Convention held in Portland last July, was the desirability of bringing the eastern and western members of the Institute together occasionally for an interchange of ideas, instead of holding two conventions each year, namely, the annual in the eastern portion of the country attended by a few of the far western members, and the Pacific Coast convention attended by only a few

200,000 people are expected to visit Electrical Homes in California before the first of the year and $20,000 will be spent in advertising these projects, according to recent estimates of the California Electrical Cooperative Campaign.

HELP THE CALIFORNIA ELECTRICAL COOPERATIVE CAMPAIGN PUT IT OVER

eastern members. The records show that no annual convention of the Institute has ever been held west of Omaha and none west of the Mississippi river since the St. Louis convention in 1904.

Pacific Coast Wireless Men to Convene in San Francisco in November

The first Pacific Coast Radio Convention and Show will be held in San Francisco November 25, 26 and 27 for the Army, Navy, Department of Commerce, Shipping Board, Radio Manufacturers, Radio Clubs and Associations, and amateur radio operators. With a slogan of "Fair play for the amateur and commercial operator," the San Francisco Radio Club expects that new standards will be set in the art, development of apparatus outlined and the good-will of western radio be promoted.

Montana Power Holds Electric Show

The first annual electric show of the Montana Power Company was held at Butte, Montana, October 4 to 8, which it was estimated more than twelve thousand people attended. While the amount of merchandise sold during the demonstrations was gratifying to the firms participating, the show was intended primarily as an educational exhibit rather than a merchandising proposition. It is expected that the show will be made an annual event there in the future.

Utah A. I. E. E. to Help Organize Engineering Council of Utah

The Utah Section of the A. I. E. E. at its meeting of October 15 approved the proposed constitution of the Engineering Council of Utah and agreed to cooperate with the other engineering societies in effecting a permanent organization.

An interesting paper on "The Outstanding Features of the 1920 Convention" was presented by H. T. Plumb, official delegate to the Annual Convention, who also reported on the Pacific Coast Convention. In connection with this latter convention, Mr. Plumb expressed the opinion that in one respect in particular it was more satisfactory than the Annual Convention, namely, that there were fewer papers and more time allowed for discussion and for getting acquainted with the other delegates.

The Section also filed a petition asking that the sphere of its activities and membership be extended from its present limitation of sixty miles radius of Salt Lake City to include all qualified electrical engineers from the southern border of Utah to St. Anthony, Idaho.

San Francisco Electrical Retailers Hear Talk on Advertising

The regular semi-monthly meeting of the San Francisco Electrical Retailers' Association was held on the evening of October 13. Rollin C. Ayers, advertising manager of the Zellerbach Paper Company and past vice-president of the Associated Ad Clubs of the World, spoke on "Cash Drawer Value of Better Business Practices," and told of the work that was being done by the Associated Ad Club and Better Business Bureaus to keep advertising truthful. He dwelt at length on the necessity for straightforward advertising in the newspapers and reminded the members of the Association that newspaper advertising was not the only kind of advertising, but that a satisfied customer who would talk favorably about the service received at their stores was one of the best advertisements they could possibly have.

Synchronous Club Holds Interesting Meeting

"One of the best meetings which has been held in the last two years," was the verdict of over 100 members of the Los Angeles Synchronous Club following the gathering of October 12. Two highly entertaining and instructive addresses were given. The first was presented by Lieut. H. E. Barden, U. S. N., who discussed the recent voyage of the German submarine U.B. 88. Lieut. Barden was navigating officer on this cruise which was made for the purpose of observing any features of these boats which may be adopted by this country. In the talk particular attention was devoted to the electrical features of the boats, both for operation and signaling.

A very clear account of modern automatic substations was given by G. B. Korker, engineer for the Westinghouse Electric & Manufacturing Company. Mr. Kirker described the five automatic stations now in service for the Pacific Electric Railway. These are rotary converter outfits of 1000 kilowatts capacity.

Seattle A. I. E. E. to Hear Exposition of Light Theories

At the regular monthly meeting of the Seattle Chapter of the A. I. E. E. on November 16 J. D. Ross, superintendent of the Municipal Light and Power System, Seattle, will present an illustrated paper on "Radiant Energy and Its Relation to Matter, Space and Time." Mr. Ross will present experiments to demonstrate his theories that light travels in curves, that the magnetic line is the axis of a light wave, and other topics.

Mare Island Trip Planned For November 4th

The San Francisco chapter of the American Society of Mechanical Engineers is making definite plans for a trip to the Mare Island Navy Yard which will be held as part of the celebration to commemorate the fortieth anniversary of the society. The members of the local A. I. E. E., A. S. C. E. and the American Chemical Society are being invited to join the A. S. M. E. with their ladies on this excursion.

The party will leave the morning of the 4th on the 9:45 Monticello steamship. After a tour of the Navy Yard the party will visit the super-dreadnaught "California" which is nearing completion.

P. G. & E. Employes Hear Talk on Opportunities

The Pacific Service Employes' Association of the Pacific Gas & Electric Company, San Francisco, held its Oakland meeting on October 12, the address being given by Robert Sibley, editor of the Journal of Electricity, on "What the Future Holds for Public Service Employes."

Pacific Coast N. E. L. A. Engineering Committee Plans New Work Ahead

The Engineering Committee of the Pacific Coast Division, N. E. L. A., meeting in San Francisco on Aug. 26, got a good start on its plans for the coming year, although the work was not fully outlined. The committee is especially desirous of securing for presentation at the Annual Meeting individual reports from such members as may be engaged in new and specialized work. G. E. Armstrong was appointed permanent secretary of the committee. Tentative dates have been fixed for the next meeting for Nov. 4, 5 and 6, in the Edison Building in Los Angeles, the first day to be taken up with a meeting of the Engineering Committee and the succeeding days with a series of meetings of the Pacific Coast Technical Sub-Committees.

After a discussion of possible topics for general papers for the spring convention, it was decided that a series of descriptive papers be prepared covering the major power developments in the Pacific Coast Division that are in progress of construction this year. Chairman Klauber appointed the following men to take care of articles covering work under construction by their respective companies: P. M. Downing, Pacific Gas & Electric Company; H. A. Barre, Southern California Edison Company; Carl Heintz, City of Los Angeles; J. A. Koontz, Great Western Power Company.

Several topics were outlined for presentation and committees were appointed to prepare papers on these topics, as follows:

Power necessities and resources of California covering both steam and hydraulic sources, with approximate costs and quantities involved. P. M. Downing, chairman.

Factors affecting the fixing of rates on a power factor basis, J. P. Jollyman, chairman.

Live wire maintenance with particular reference to the practices of Pacific Coast companies. Referred to the Pacific Coast members of the Overhead Systems Committee with the suggestion that these members collect data and send it in to the Overhead Systems Committee chairman.

Study of relay and relay systems to cover the problems introduced by large interconnected systems combining steam and hydro stations. E. E. Stauffacher, chairman.

Progress on the development of 220,000-volt transmission. J. A. Koontz, chairman.

A symposium of operating difficulties. Referred to a committee consisting of the load dispatchers of the several companies.

Thirty-three-thousand-volt triplex underground distribution. Carl A. Heintz.

Reports were received from the Line Code Committee, the Safety Code Committee, the Insulator Test Committee and from the chairmen of the several committees of the Pacific Division Technical Committee. In addition, the reorganization of the Association into divisions and the new plan for committee representation was outlined by the chairman.

Manufacturers Attend N. E. L. A. Executive Committee Meeting For First Time

Representatives of electrical manufacturers for the first time attended the National Executive Committee meeting of the N. E. L. A. at National Headquarters on Sept. 1. Under the new classification adopted at the Pasadena convention E. W. Rice, president of the General Electric Company, E. M. Herr, president of the Westinghouse Electric & Manufacturing Company, and W. A. Layman, president of the Wagner Electric Manufacturing Company, were appointed members of the committee. The first two members were present but transportation delays prevented the appearance of Mr. Layman.

The national budget was presented and approved, while a gain of 287 members over the past year was reported. The two remaining big meetings of the year will be held in December and March, but no action was taken regarding the place at which the 1921 convention will be held.

Indorsement was given to the recent action of the American Water Works Association in its approval of the grounding of secondaries of electric light systems to water-piping systems.

New Members of the A. I. E. E.

The large proportion of Western men appearing in the list of those recently elected to membership in the American Institute of Electrical Engineers indicates the increasingly active part this section of the country is playing in Institute affairs.

Henry S. Peck, sales engineer, A. H. Cox & Co., Seattle, Wash., was elected to membership.

Transferred to Grade of Member —

Donald C. Barnes, manager, Seattle Division, Puget Sound Power & Light Company, Seattle, Wash.; **Willis T. Batcheller,** electrical and mechanical engineer, Seattle Municipal Light and Power System, Seattle, Wash.; **William F. Durand,** professor of mechanical engineering, Stanford University, Stanford University, Cal.; **Llewellyn Evans,** superintendent of electric works, City of Tacoma, Tacoma, Wash.; **John A. Koontz, Jr.,** electrical engineer, Great Western Power Company, San Francisco, Cal.; **Alvin A. Miller,** manager, power and railway divisions, Westinghouse Electric & Manufacturing Company, Seattle, Wash.; **Roy R. Robley,** operating engineer, Portland Railway Light & Power Company, Portland, Ore.

Transferred to Grade of Fellow —

Reinier Beeuwkes, electrical engineer, Chicago, Milwaukee & St. Paul Railroad Company, Seattle, Wash.; **George R. Murphy,** manager, Pacific district, Electric Storage Battery Company, San Francisco, Cal.

Associates Elected —

John Bankus, electrical engineer, Portland Railway Light & Power Company, Portland, Ore.; **Andrew G. Betts,** meter superintendent, Puget Sound Power & Light Company, Tacoma, Wash.; **Herbert A. Boring,** sales agent, General Electric Company, Seattle, Wash.; **Robert Q. Brown,** acting instructor in civil engineering, University of Washington, Seattle, Wash.; **Leslie W. Calvert,** chief electrician, Weyerhaeuser Timber Company, Everett, Wash.; **Leon H. Chamberlain,** switchboard engineer, The Pacific Tel. & Tel. Company, San Francisco, Cal.; **Lester L. Conrad,** laboratoryman, Southern California Edison Company, Los Angeles, Cal.; **Alvin F. Darland,** chief electrician, Todd Dry Dock & Construction Corp., Tacoma, Wash.; **John A. Fletcher,** assistant district manager, Canadian General Electric Company, Ltd., Vancouver, B. C.; **Clarence C. Gifford,** electrical engineer, Los Angeles Shipbuilding & Drydock Company, San Pedro, Cal.; **James L. Green,** engineer, Northern Electric Company, Ltd., Regina, Sask., Canada; **Charles D. Herrold,** Street Car Industrial Co., San Jose, Cal.; **William Hubbert,** electrical foreman, Skinner & Eddy Corporation, Seattle, Wash.; **Clarence L. Johnson,** telephone engineer, The Pacific Tel & Tel. Co., San Francisco, Cal.; **William C. Kinderman,** chief electrician, Holt Mfg. Co., Stockton, Cal.; **Vernon E. McCain,** salesman, Western Electric Company, Tacoma, Wash.; **George I. McFarland,** superintendent, Jordan Steam Station, Utah Power & Light Company, Salt Lake City, Utah; **Ernest E. McKeen,** electrician, Portland Railway Light & Power Company, Portland, Ore.; **A. M. McMillan,** storage battery salesman, Western Electric Company, Seattle, Wash.; **Zadoc E. Merrill,** assistant engineer, Public Service Commission of Washington, Olympia, Wash.; **Frank A. Roell,** shop superintendent, A. H. Cox & Co., Inc., South Seattle, Wash.; **Frank E. Smallidge,** president and manager, Electric Supply Company, Wenatchee, Wash.; **D. Boyd Smith,** assistant to electrical engineer, Nevada Consolidated Copper Co., McGill, Nevada; **Lester J. Turley,** engineer of electric power, chief engineer's department, Los Angeles Railway, Los Angeles, Cal.; **Walter William Tuttle,** electrical draftsman, Public Works Department, U. S. Naval Station, Pearl Harbor, T. H.; **C. E. Wagner,** shop foreman, Portland Railway Light & Power Company, Portland, Ore.; **John C. Widrig,** salesman, A. H. Cox & Co., Seattle, Wash.; **Harold B. Wood,** lineman, The Montana Power Company, Roundup, Montana; **Vernon Radford Wright,** manager, Wenatchee Battery & Motor Co., Wenatchee, Wash.

Associates Re-Elected August 12, 1920 —

August Hund, research work, Berkeley, Cal.

Elections to the Illuminating Engineering Society

Two of the five new members recently elected to membership in the Illuminating Engineering Society are Western men. They are:

Robert L. Eltringham, electrical engineer, Industrial Accident Commission of the state of California, San Francisco, Cal., and **John Leuthold,** publisher Summit County Star, Breckenridge, Colo.

Of the fourteen Associate members elected at the same time, nine are Western men. They are:

P. A. Anderson, industrial engineer, Great Western Power Company, Oakland, Cal.; **George E. Armstrong,** McGraw-Hill Publishing Company, Inc., San Francisco, Cal.; **Arthur F. Buss,** building equipment specialist, General Electric Company, San Francisco, Cal.; **Ernest M. Frellson,** salesman, Edison Lamp Works, San Francisco, Cal.; **Frank J. Gleiss,** assistant superintendent electrical distribution, Oakland District, Oakland, Cal.; **David Edward Harris,** vice-president and general manager, Pacific States Electric Company, San Francisco, Cal.; **Allen Higgins, Jr.,** salesman, Westinghouse Electric & Manufacturing Company, San Francisco, Cal.; **Herbert J. Mayo,** sales engineer, Benjamin Electric Manufacturing Company, San Francisco, Cal., and **W. L. Stockwell,** manager, J. C. English Company of California, San Francisco, Cal.

The two transfers to Member grade are:

Romaine W. Myers, consulting electrical and illuminating engineer, Oakland, Cal., and **Robert S. Prussin,** district illuminating engineer, Westinghouse Lamp Company, San Francisco, Cal.

The two Associate Members elected subject to the approval of the Board of Examiners are:

H. B. Blandon, manager lighting division, Alexander & Lavenson Electric Supply Company, San Francisco, Cal., and **S. P. Russell,** vice-president H. B. Squires Company, San Francisco, Cal.

H. C. Hoover Urges Engineer Activity in Community Affairs

During Herbert C. Hoover's recent visit in Portland, Ore., he spoke to a representative gathering of engineers of all branches on the importance and necessity of establishing a department of Public Works in the federal government.

He urged engineers to take a more active part in the social, civic and economic affairs of their communities and of the country, and stated that a speedy and successful solution of the economic situation that confronts the country could only be brought about by the cooperation of the engineer with his quantitative aspect of mind.

COMING CONVENTIONS

ELECTRICAL SUPPLY JOBBERS' ASSOCIATION
Semi-Annual Meeting—Cleveland, Ohio
November 17, 18, 19, 1920

PACIFIC COAST RADIO CONVENTION
The First Pacific Coast—San Francisco, Cal.
November 25, 26, 27, 1920

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS
Annual Convention—Salt Lake City, Utah
June 20-26, 1920

50,309,000 sq. mi. is the area of the Pacific Ocean. This area is destined to be the scene of the great developments in commerce and in the progress of civilization within the coming century.

HELP THE PAN-PACIFIC EMPIRE PUT IT OVER

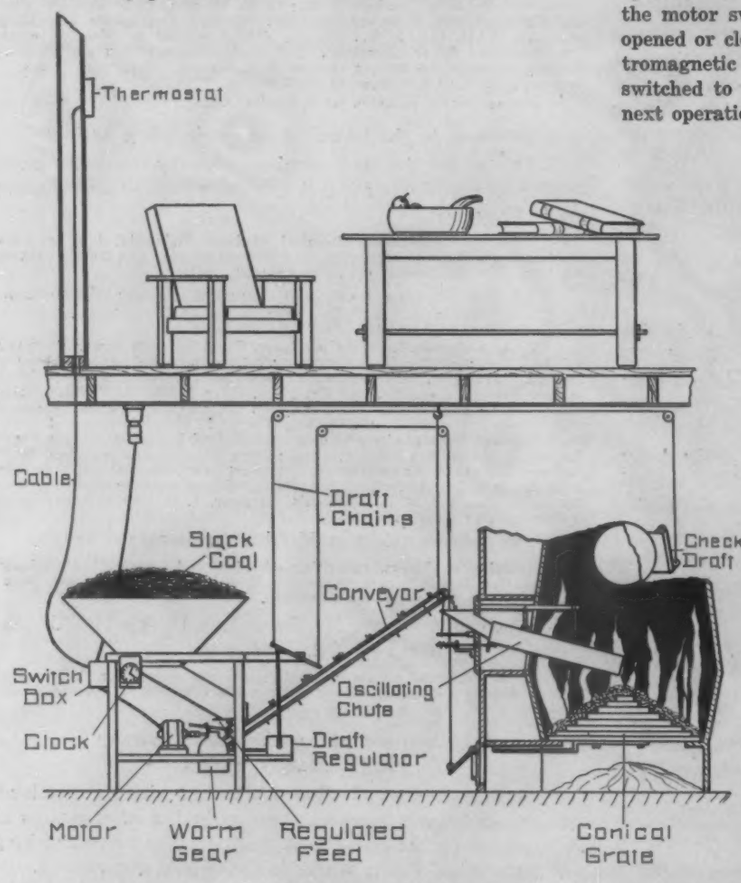
LATEST IN EVERYTHING ELECTRICAL

(Everyone from the small boy to the engineer is interested in a convenience device for the home such as the electrically-operated stocker presented on these pages. Another device described is one which will improve lighting service in small steam plants, on steam shovels, oil well derricks and locomotives. Booklets on the California Hydro-Electric Securities, The Airplane Propeller and Hydro-Electric Power in the Niagara District are among the reviews of books and bulletins.—The Editor.)

AUTOMATIC STOKER FOR HOUSEHOLD USE

An electrically-operated automatic stoker has been perfected and is now being placed on the market by the Domestic Stoker & Manufacturing Company, Salt Lake City, Utah.

The object of the device is to provide a simple and reliable stoker for household use that will fire a furnace scientifically and eliminate a considerable portion of the smoke usually produced.



The coal bill can be greatly reduced and the regulation furnace dirt done away with by this new electrically-operated automatic stoker.

The device is operated by a small electric motor which is also used to operate the draft and circuit changing mechanism. A hopper containing two hundred and fifty pounds of slack coal feeds a chute from which an adjustable slide delivers the fuel to a conveyor. The latter carries the fuel to an oscillating chute projecting into the furnace, whence it is dropped on the center of a conical grate.

The thermostat, which might be called the brains of the device, is situated in the living room and is directly responsive to change in temperature. Its range of temperature between the upper and lower limits is about one-half degree. When either limit is reached an electric circuit is closed which actuates an electromagnetic switch and closes the motor circuit. If this limit is the lower one the motor causes the damper to open and the check draft to close. At the same time a motor switch is closed which causes the motor to continue to operate and drive the stoker. The fuel being fed to the furnace rapidly takes fire and the temperature rises to the upper limit. When the thermostat reaches this limit the electromagnetic switch is again closed, the check draft is opened, and the damper is closed. Also by the same operation the motor switch is opened. Whenever the motor switch is opened or closed the thermostatic circuit is broken, the electromagnetic switch opened, and the thermostat connection switched to the other temperature limit preparatory to the next operation.

TURBINE GENERATOR UNITS FOR LOCOMOTIVE HEADLIGHTS

Although developed especially for supplying energy for locomotive headlights, the turbine-generator units just placed upon the market by the Westinghouse Electric & Manufacturing Company may be used for lighting service in small isolated steam plants such as pumping stations, small steam shovels, oil well derricks and in other applications where a small amount of lighting is required. The construction is especially advantageous for portable application, as it is designed for severe outdoor service.

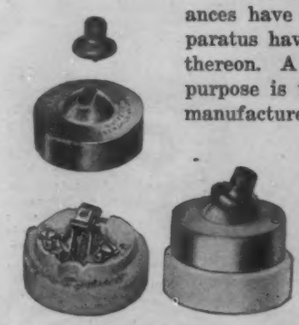
This unit is light and compact, requiring no foundations. It can be set up on a floor, heavy board or in any horizontal place and held in position with four small bolts, studs or lag screws.

While totally enclosed all parts are readily accessible by removing the end cover on the generator and the turbine end casing on the steam end. There are only five moving parts—the shaft carrying the generator armature and the turbine rotor, two governor weights, governor spindle and governor steam valve stem, thus making for simplicity of operation.

The generator end consists of one casting containing one bearing and the field poles with windings.

NEW TOGGLE SWITCH

Users of household electrical appliances have exhibited a preference for apparatus having an electric switch mounted thereon. A most convenient device for this purpose is the new toggle-switch which is manufactured by the Bryant Electric Company, of Bridgeport, Conn. The base is of porcelain in which the mechanism is fastened and sealed in accordance with Underwriters' specifications, to prevent loosening. The device is catalogued as number 2902.



Colored Lights For the Show Window

Many different makeshift schemes have been used to produce the desired color effects in display windows. In some cases gelatin has been applied and harnessed to the reflector by various methods. Incandescent lamps have been colored with various kinds of "lamp dip," but this has proved unsatisfactory because the heat of the lamp rapidly fades out the color. The use of natural colored glass lamps of the Mazda "C" type has also proved unsatisfactory.

The new "Color-Ray" unit for use in window display lighting which was presented for the first time at the recent convention of the International Association of Display Men.

The engineering department of the National X-Ray Reflector Company has developed a means of producing colored light in show windows which seems to have solved the problem of color effects.

The device which they present will be called by the trade name "Color-Ray" and consists of a metal frame which fits over the mouth of the X-Ray Jove and Jupitor Reflectors. This frame supports a slide of colored gelatin which is held in place by fine steel meshes. The slide slips in the frame so that the color can be changed readily. When the ordinary white light is desired the slides may be left out altogether, being very inconspicuous and in no way interfering with the amount of light that is produced.

The frame is fastened to the X-ray reflector by means of an asbestos cord harness designed so that it may be attached without disturbing either the reflector or the lamp.

A CONVENIENT SWITCH EXTENSION

The St. Louis Brass Manufacturing Company announces a new product which they will put on the market under the name of the Brasco Switch Extensions as soon as the patents are granted. This is a small arm-like case which extends along the ceiling carrying the wire to the point from which it is attached either to a pendent or pull switch.

These switch extensions are made of steel, are zinc-plated and have a rust-proof finish. In furnishing large buildings they are especially valuable in that they save wiring for wall switches and are less costly and more satisfactory than knob work on concrete ceilings.

As shown in the sketch above, either the pendent or pull switch can be neatly attached to any type of fixture of the new Brasco Switch Extension.

Books and Bulletins

California Hydro-Electric Securities

In order to increase the market for California hydro-electric securities throughout the United States, the Los Angeles office of Blyth, Witter & Company has published a booklet which sets forth in a most convincing and attractive way, that data which will bring about the investment of $700,000,000 in the electrical industry of that state within the next ten years.

This most readable material is divided into four chapters which appear under the following headings: Hydro-electric power is essential to the growth and prosperity of California; The history of hydroelectric development in California is inextricably interwoven with the state's industrial development; California's hydroelectric companies present attractive investment-field and Blyth, Witter & Company hold an enviable position in the financial domain of hydro-electric development.

The Air Propeller

Those who want a practical working knowledge of the characteristics of the air propeller and a general knowledge of its theory will welcome the book by Frederick Bedell, which has recently been published by D. Van Nostrand Company under the name of "The Air Propeller."

The author, who is professor of physics at Cornell University and a well known writer of technical books, is now preparing a book, "The Airplane," and the material in "The Air Propeller" is to be revised and included in this larger book. A brief discussion of the airplane engine and the power available for airplane propulsion is also included.

Hydroelectric Power in the Niagara District

The Hydro-Electric Power Commission of Ontario has published a thirty-page booklet which tells in an interesting manner the story of the development of hydroelectric power in the province of Ontario, Canada. Sketches and photographs show how power is generated at Niagara Falls and how this power is used in agriculture and industry.

An idea of the significance of the development of this district to the electrical industry is gained by considering that the province contains a supply of water power aggregating in all 6,000,000 horsepower, of which approximately 800,000 horsepower has already been developed.

Battery Charging Equipment

The latest equipment for the charging electric street vehicles, industrial trucks and battery locomotives is described in Publication 830 of the Cutler-Hammer Manufacturing Company. An introduction reviews briefly the different methods of charging and the various kinds of equipment, with a view of aiding the reader in selecting the type of equipment best suited to the particular conditions with which he has to deal.

In the main part of the booklet, C-H charging equipment is described in detail with illustrations and descriptions.

1,000,350,000 good words for the West have been published by the Journal of Electricity since it was founded thirty-four years ago. It is working for the best interests of the electrical industry in the region west of the Rocky Mountains and in the great countries bordering the Pacific Ocean.

HELP THE JOURNAL OF ELECTRICITY PUT IT OVER

NEW ELECTRICAL DEVELOPMENTS

(Plans for the development of the upper falls of the Spokane River and an account of charges that a city is monopolizing the electrical supply business are important among Northwest items. The Pacific Central and Southwest districts report the construction of a number of power plants and news of the construction of several large industrial plants comes from the Intermountain district.—The Editor.)

THE PACIFIC NORTHWEST

BURNS, ORE.—Plans and estimates have been furnished for a municipal lighting system, estimated to cost $53,127.

THE DALLES, ORE.—A contract has been let for the installation of 72 ornamental lighting posts to be installed in the business section of the city. Pressed steel posts with 300-watt lights will be used.

BURNS, ORE.—The city council has received from Engineer I. C. Kelsey estimates for the installation of the proposed municipal light and water plant. Engineer Kelsey estimates the cost at $300,000.

SALEM, ORE.—The Nevada-California-Oregon Telephone & Telegraph Company, with headquarters at Susanville, Cal., has filed application with the Oregon Public Service Commission to establish a telephone exchange at Lakeview, Ore.

ASTORIA, ORE.—The Pacific Power & Light Company, with headquarters in Portland, has filed application with the Oregon Public Service Commission for permission to increase fares on its traction lines in Astoria from 5 to 7 cents.

CENTRALIA, WASH.—The Sherman County Power & Light Company has begun operation of its new 1250-kw. Curtis steam turbine, which will supply service to the city of Centralia. The company also contemplates the operation of a line to Chehalis, Wash.

FREEWATER, ORE.—The Peacock Mill Company has applied to the state engineer for permit to construct a power plant in Umatilla county. The plant is to be built in units and completed within four years. Construction contemplated includes a pipe line 1.5 inches long, concrete weir for diversion, and 54-inch wood pipe conveying water to turbine. The first unit will cost $140,000.

ILWACO, WASH.—According to recent reports, this town is considering the purchase of the distribution system of the North Shore Light & Power Company and the installation of a 1,000-kilowatt generating plant. This will, it is believed, solve the light and power question for some time to come. At present negotiations are under way with E. E. Wood, manager of the utility company, and if they are culminated satisfactorily the lines will be taken over as soon as possible.

SEATTLE, WASH.—Seattle city officials have been advised by the state hydraulic engineer at Olympia that the city has been granted permits to appropriate waters required in the development of the Skagit River municipal hydroelectric power site. This completes the last of the state and federal permits required for the Gorge Creek project, and the Rub Creek development. These permits cover the proposed $25,000,000 Ruby Creek dam and plant construction, the $10,000,000 Gorge dam and plant, 1,000,000 acre-feet of water storage in the channel of the Skagit river, and the construction of a power plant on Newhalem Creek to generate power needed in prosecuting the main work.

SPOKANE, WASH.—The development of the upper falls of the Spokane River at Spokane, with a potential horsepower estimated between 10,000 and 15,000 hp., is under consideration by the Washington Water Power Company, President D. L. Huntington has announced. "The next two or three months should suffice to make our plans fairly definite regarding other developments which we find enlarged power demands require us to make," said Mr. Huntington. "All of them are widely different in type. The upper falls development is the only one in consideration in the city, the others being outside the city limits. The increase in the growth of the power business has been steady and consistent and means that wise foresight should be exercised to add facilities for supplying the demand."

TACOMA, WASH.—According to a statement of Llewellyn Evans, superintendent of light, the limit of the capacity of the La Grande power plant of the city, against which the light department gave warning several years ago and toward the relief of which the acquisition of the Lake Cushman power site is aimed, has actually made its appearance. The winter demand for current, coming on top of the increase in the load which the industrial growth of Tacoma has caused during the last year, has now run the city past its capacity of production, he states. Recently, the city began buying power from the Tacoma Railway & Power Company during the peak hours of the days, although its four generators at La Grande were working even beyond their rightful capacity. The Lake Cushman power is needed immediately, but cannot be counted upon for probably two years. Condemnation hearing in Mason county is set for November 20.

TACOMA, WASH.—Injunction proceedings, charging the city of Tacoma with exercising a monopoly on the electrical supply business, have been filed against the city and Ira S. Davisson, as commissioner of the light department, by A. Z. Smith, R. A. Wheelock and Roy F. Owen, three local dealers in electrical apparatus. Seven alleged unfair practices are cited by the complainants, which they declare they have undertaken for themselves and all other persons and corporations in the city similarly situated. Numerous unlawful and unreasonable methods employed by the city in handling electrical apparatus, they say, has lost them large sums of money, and has resulted in their oppression as taxpayers, license payers and business men. The complaint alleges that the city sells electrical apparatus and appliances at 5 per cent above cost; that motors are leased by the city or an agreement made with the party that he can buy the motor and get credit for any amount of rent paid up until 12 months, less the interest on the investment; that the city has secured contracts with one or more large manufacturers for the exclusive handling and sale of their motors; violation of the city charter because of the alleged habit of the commissioner of purchasing electrical goods without calling for bids, where supplies exceed $500 in cost; that the city carried on a general business with all comers, whether in or out of the city; that the city makes bids unlawfully in competition with all dealers, when bids are called for; that it is the city's practice of keeping leased motors in repair, the cost for this being absorbed by the city out of its treasury. For all these items, the plaintiffs ask the court to restrain the city from continuing such practices. In a second and separate cause of action brought by the three dealers, they declare that an early shortage of power threatens the residents of the city through Commissioner Davisson's practice of selling power. At the cost of $2,000,000, the city built a hydroelectric generating plant, they declare, with ample capacity to supply the city with light and heat for many years to come. Of late, they say, Commissioner Davisson has exceeded his powers and sold current to many persons and corporations outside the city, so that the amount of power is greatly reduced. Such sale of power, it is alleged, has been made at rates below those charged to the citizens of Tacoma.

THE PACIFIC CENTRAL DISTRICT

BAKERSFIELD, CAL.—Plans are being made to install a large concrete dam in Tejon Pass canyon, to impound water for reclaiming Tejon ranch acreage.

FRESNO, CAL.—Work was started about the middle of October on the San Joaquin Light & Power Corporation's new $50,000 substation to supply the towns of San Joaquin and Tranquility in Fresno county. Three 1500-kw. transformers will be installed. Estimated cost of the 60,000-kv. line, 24 miles long is $86,000, while the cost of the distribution line is estimated at $125,000.

SACRAMENTO, CAL.—The United States Electric Steel Production Company of San Francisco contemplates the construction of a $5,000,000 plant in Sacramento, according to a letter addressed to the City Commission. The proposed plant would develop 100,000 hydroelectric horsepower, according to the plans. The company is asking for a free site in the city. The letter has been referred to the Chamber of Commerce.

SAN FRANCISCO, CAL.—It having been held by the State Supreme Court that a municipal corporation in the operation of its utilities, either within its own limits or in outside territory is not under the control of the Railroad Commission, the Commission has ordered the dismissal of the complaint filed by the Southern Sierras Power Company against the City of Los Angeles. The complaint involved service extension.

MARYSVILLE, CAL.—Resumption of gold-dredging along normal lines is announced from the Yuba river and Oroville fields, following lifting of the ban against the use of electric power. Practically all the companies have been operating part time since early summer because of shortage of power, and several dredges were closed down. Near Hammonton the Yuba Consolidated Goldfields has eight monster dredges in commission.

STOCKTON, CAL.—Involving a $2,000,000 power plant project, application for storage and use of part of the natural flow of the north fork of the Stanislaus river has been filed with the recorder of Tuolumne county. Frank B. Pattee of Oakdale and Samuel Bernhard of San Francisco have applied for the water rights in contemplation of the erection of the large power plant near the headwaters of the river to develop about 9,600 horsepower.

OAKLAND, CAL.—Estimates of the costs of three different projects proposed at the Seventh street crossing are being made by Harbor Engineer K. S. Heck, in preparation for the reopened Railroad Commission hearing. Heck will investigate the possibility of an extension of the Sixteenth street trestle for 1,000 feet toward Seventh street; a highway incline over the Southern Pacific tracks and a subway under the

tracks. His estimates of costs will be submitted to Commissioner Frederick Soderberg.

OAKDALE, CAL.—The Pacific Gas & Electric Company has a force of men at work on construction of the Spring Gap power house, the first unit in a program which calls for the expenditure of $4,000,000 or $5,000,000 in reservoir and other work along the Stanislaus river. Tuolumne county is opposing the construction of this power house because of the fear that it may cause a loss of water by diversion of the stream of the south fork of the Stanislaus to the middle fork. However, this will make it possible to use the water for a second time for power, and will give the company more water to sell to the Oakdale and South San Joaquin irrigation districts for irrigation. The Water Commission now has the matter up for adjudication, and is expected to shortly give a decision.

FRESNO, CAL.—The new Midway steam plant of the San Joaquin Light & Power Corporation, the camp for which was established at Button Willow, Kern county, is well under way. One 12,500 kva. unit with transformers, etc., is due on the ground in December or January and it is expected to operate the plant by June. The ultimate development of the plant is four 12,500 kva. units, the generating and transforming equipment of which is of General Electric manufacture and the switching equipment Westinghouse. The plant is located practically in the Elk Hills oil district where the Standard Oil Company has in the last few months brought in several large new gas wells. The boilers will be equipped entirely with gas furnaces which can be turned over with little difficulty to oil burning fuel if the supply of natural gas should fail.

SACRAMENTO, CAL.—Following the completion of a $2,000,000 irrigation system and the building of the Southern Pacific Railroad through the property, it is announced that the Sutter basin project in the Sacramento valley is to be colonized. This property, comprising upward of 45,000 acres, has been under cultivation for three years and this season produced 2,000 carloads of grain and vegetables. Sutter basin lies at the confluence of the Sacramento and Feather rivers, twenty-three miles northwest of Sacramento. It is the last great body of an alluvial soil in the Sacramento valley to be developed and prepared for settlement. Unlike most bottom land development projects, the Sutter basin has a complete irrigation system with a pumping plant at Tisdale capable of throwing 1,380 acre-feet of water daily and two other smaller plants.

HANFORD, CAL.—That natural gas will be used in the cities and towns of Kings county seems highly probable now that the sale of a franchise for such a purpose has been ordered by the supervisors at the instance of Mayor F. A. Cleveland, of Corcoran. The Tulare lake gas wells near Corcoran have been reported producing large quantities of gas and this action is considered but the recognition of the possibility of organizing such a distributive company.

SONORA, CAL.—Application has been made for 130 cubic feet per second or 5,200 miners' inches of water from the north fork of the Stanislaus river for a two million dollar electric power proposition to be known as the Ramsey Project, which will develop 9,600 horsepower. The point of diversion is in the counties of Tuolumne and Calaveras on the north fork of the Stanislaus river, above the junction of Rattlesnake Creek. The canal and pipe line is to be 11¾ miles in length, terminating near the South Grove of Big Trees. The dam will be 225 ft. high, 1,040 ft. long on the top and 30 ft. long on the bottom; width of top, 10 ft. The dam will be of rock-fill construction with concrete face reinforced. Construction work will begin in two years and be finished within five years. There will be a fall of 924 feet to power in the river.

THE PACIFIC SOUTHWEST

JEROME, ARIZ.—Construction of the impounding dam at Box Canyon, nine miles below Camp Verde, may be under way as early as January.

SANTA BARBARA, CAL.—Plans are under way for the construction of the dam on the Mono, at a cost of $1,500,000, for Montesito water supply.

CORONA, CAL.—Extension of the Pacific Electric line is contemplated to connect up the line between Corona and Stern, a distance of about 12 miles.

CASA GRANDE, ARIZ.—Mark A. Smith recommends that a bond issue for $300,000 is the only feasible means of building the San Carlos dam, to be issued by the Government and the proceeds placed in the reclamation fund.

GARDEN GROVE, CAL.—A special bond election was held October 25 for the purpose of voting on a bond issue for $100,000, for the purpose of constructing necessary conduits, drains, etc., for draining lands and acquiring necessary property.

LOS ANGELES, CAL.—Sealed bids will be received by the Board of Supervisors, up to 11 a.m. Nov. 8, for furnishing all labor and material necessary for the erection of timber concrete lined pipe duct and accessories at the County Farm in accordance with plans and specifications on file in the office of the Board of Supervisors.

TUCSON, ARIZ.—Fire of unknown origin has destroyed the gas plant of the Tucson Gas, Electric Light and Power Company, causing a loss estimated at about $50,000, which is fully covered by insurance, it was stated. The fire, which was said to have originated in the generating room of the plant, spread quickly throughout the establishment owing to the inflammable material of which the building was constructed.

LOS ANGELES, CAL.—A resolution commending the Southern California Edison Company for initiating a $200,000,000 project to furnish adequate electrical power to Southern California and urging the Railroad Commission to grant a rate increase to the company was adopted at a meeting of the board of directors of the Los Angeles County Farm Bureau recently. The resolution states that the project can become a reality if the increase in rates is granted.

REDLANDS, CAL.—The Southern Sierras Company is planning on building at least one and probably two big power houses in Mill Creek Canyon. The company has heretofore operated power houses in Inyo county alone. The plan is for a big power house just above the Edison intake in the Mill Creek; in fact, the spillway from the Southern Sierras house would empty into Edison intake. The other power house will be farther up the canyon so that the first power house will get the necessary fall. The Mill Creek plants will be operated almost entirely as reserve plants. They will generate 2500 horsepower.

SANTA FE, NEW MEX.—The first official step toward building an interurban electric railway north from Albuquerque was taken recently when the City Electric Railway Company, incorporated under the laws of Arizona, filed a foreign corporation's statement in the Corporation Commission's offices. The filing of the statement permits the company to do business in New Mexico. The City Electric's purpose, according to a statement, is the building and operation of trolley lines and it was said unofficially that the company's first project would be the construction of a line north from Albuquerque along the Albuquerque-Alameda road. The project has been under consideration for some time, but until today no official indication of intention to carry out the plan was given. The City Electric of Arizona, although it has the same name as the company which operates the local system in the Duke City, is an independent company capitalized at $150,000, of which $20,000 has been issued.

THE INTER-MOUNTAIN DISTRICT

SALT LAKE CITY, UTAH.—Permission has been granted to the Utah Power & Light Company by the Public Utilities Commission of Utah to extend its lines to Millville, and in Juab county.

BRIGHAM CITY, UTAH.—Brigham City has sold its $200,000 electric light bonds to the Hanchett Bond Company of Chicago for $192,500. This action was taken by the city council at an adjourned meeting held October 16.

LAVINA, MONT.—It is reported that the Town Council is making plans to install a municipal lighting system. Certain preliminary steps have been taken and C. A. Renshow, engineer of Roundup, Mont., has been engaged to supervise the work. Bids have been called for. It has been decided to use wooden poles for the mounting of the lights.

SALT LAKE CITY, UTAH.—The new plant of the Uintah Power & Light Company, fifteen miles northwest of Roosevelt, on the Uintah river, is now ready for operation. This plant will supply power to Duchesne, Roosevelt, Myton and other towns in that vicinity.

DENVER, COLO.—Ground will be broken in 90 days for the plant of the Howard Pulp & Paper Company, a newly organized corporation for the manufacture and sale of news-print paper on a large scale. The mill will be erected at Idaho Falls, Idaho, in absolutely virgin territory and in an area which is ideal for timber, logging and milling of the product.

OGDEN, UTAH.—Construction work has begun upon the new ice plant to be erected in the railroad district by the Pacific Fruit Company. This plant will be electrically operated, the initial load being about 1500 horsepower. The plant, it is said, will be the largest ice plant in the West, having a daily output capacity of 250 tons and a storage capacity of 20,000 tons. It is expected that the plant will be completed by July 1 of next year.

MISSOULA, MONT.—Through the efforts of James Harbert, recently elected one of the vice-presidents of the Northwest Reclamation League, facts and figures of vital interest to residents of western Montana were obtained by him from the committee of the Columbia Basin Survey commission, regarding one of their projects, the erection of a dam at Big Rock, located one and three-quarters miles below Polson, which will be known when completed as the Big Rock dam.

SALT LAKE CITY, UTAH.—Utah Granite & Marble Company has filed application with the state engineer for the use of ten second-feet of water from Little Cottonwood Creek, in Salt Lake county, to develop 270 horsepower. A wood or concrete dam is planned in the river, from which the water would be conducted by an earth channel, a wooden flume and an iron pipe 36- in. in diameter, falling over a 48-inch Pelton wheel under a head of 300 ft. The site named for the diversion works is about three miles east and twelve miles south of the business district of Salt Lake City.

POCATELLO, IDA.—A project which comprises the canalization of the lower Snake River for the purpose of making a deep water inlet from tidewater to Lewiston, Idaho, was discussed at a recent meeting held at Lewiston by the United States board of engineers with local people interested in the proposition. The project, which has been officially surveyed by federal engineers, comprises locks and ten dams along the Snake River between Lewiston and Riparia, Wash. The possibility of establishing large power plants at the dams, for the purpose of supplying electric current to the manufacturing industries which are developing in that section, is one of the principal considerations in connection with this project.

The enterprising mind, which is not afraid to strike out in a new direction, has always been an object of admiration. But what about this:

"An inquirer desires to purchase machinery and supplies for a small tannery, and also a book of information regarding the operation and manufacture of a tannery."

We suggest that for the benefit of enterprising beginners all businesses selling out should throw in a book of directions. Thus:

"For Sale—Small hydroelectric system, complete with book of information regarding power-plant operation and maintenance. A child can use it."

* * *

A few advertisements that we are not planning to run in the Searchlight Section are as follows:

Wanted—a female donkey. Apply personally.

Wanted—Movie theatre piano player; no experience necessary.

Wanted—Housekeeper, for a man and two middle-aged children.

Wanted—Respectable sales girls. No flirts need apply. We'll teach you.

* * *

In spare moments—that is after we have read the colyums and the comic sections—we study the market reports, and "view with alarm" the constant abusive publicity which is given to the gentle and harmless egg.

"Eggs strong," says one headline. Well, any eggs are if you keep them long enough. "Best Eggs Off," says another, leading the public to wonder what the lower grade of eggs must be like. "China Eggs Crash" sounds like a needless remark. Why throw them around? An article headed "Eggs Fall with Butter" is, we presume, the biography of an omelette. But the point is that whatever happens to eggs the paper always makes the worst of it.

* * *

Still another contribution to our volume of Useless Statistics affirms that if all the stamps issued by the government during the past fiscal year were collected and laid end to end, they would form a chain 18,000 miles long, about equal to the distance from New York to the Philippines. The writer goes on to say that the number was 10,061,439,768, representing a face value of $180,957,385. Of the whole number 5,130,249,018 were two cent stamps and 3,798,961,039 were one cent. But one thirty-cent stamp was issued.

Will anyone confess to that thirty-cent stamp?

Originality in business cards is being advocated by a writer on salesmanship. He says:

For example, one of the best business cards in the world is a recent magazine opened to your firm's advertisement.

Another highly practical form of business card is the article you are selling. When the prospect holds out his hand for your card, hand him a sample of the device you are peddling—or a picture of it, or a substantial facsimile of a testimonial letter.

The conventional business card is like a conventionalized selling talk. It is correct, but it lacks effectiveness and spontaneity of an original and unexpected approach.

That may be all right if the prospect comes out and gets your card himself, but would you send the office boy in with a copy of the telephone directory or the Saturday Evening Post on a silver tray? And besides, your business cards are very seldom returned to you, and carrying an adequate supply of this kind you might be mistaken for a book agent. The other idea also has its good points, but personally we should be rather disconcerted if we held out our hand to a salesman for his card and he handed us a washing machine, or a picture of an electric range.

* * *

Art in business seems to be going a little far. A recent advertisement reads:

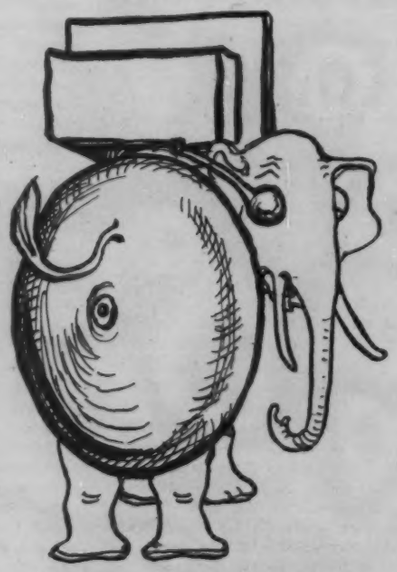
"Firm of manufacturing silversmiths, consisting of artistic novelties, desires to find a market here for its goods."

Now a silversmith who is an "artistic novelty" must be worth seeing, but a whole firm consisting entirely of artistic novelties ought to go into the circus business.

* * *

"Large scale production" is an integral part of the modern industrial system, but it seems that some people have been abusing the meaning of the term. A negro in Memphis needed a new pair of overalls, and a Scranton, Pennsylvania, factory got the order. The garment used up 25 yards of material. It has a girth of 106 inches and each hip pocket will hold a watermelon. The owner is nine feet, four inches tall, and weighs 540 pounds.

* * *



ELECTRICAL HYBRIDS — I.

The Electric Bellephant

The Bellephant is very shy;
He lives up near the ceiling,
And any caller at the door
Is sure to start him squealing.